# Public Roads

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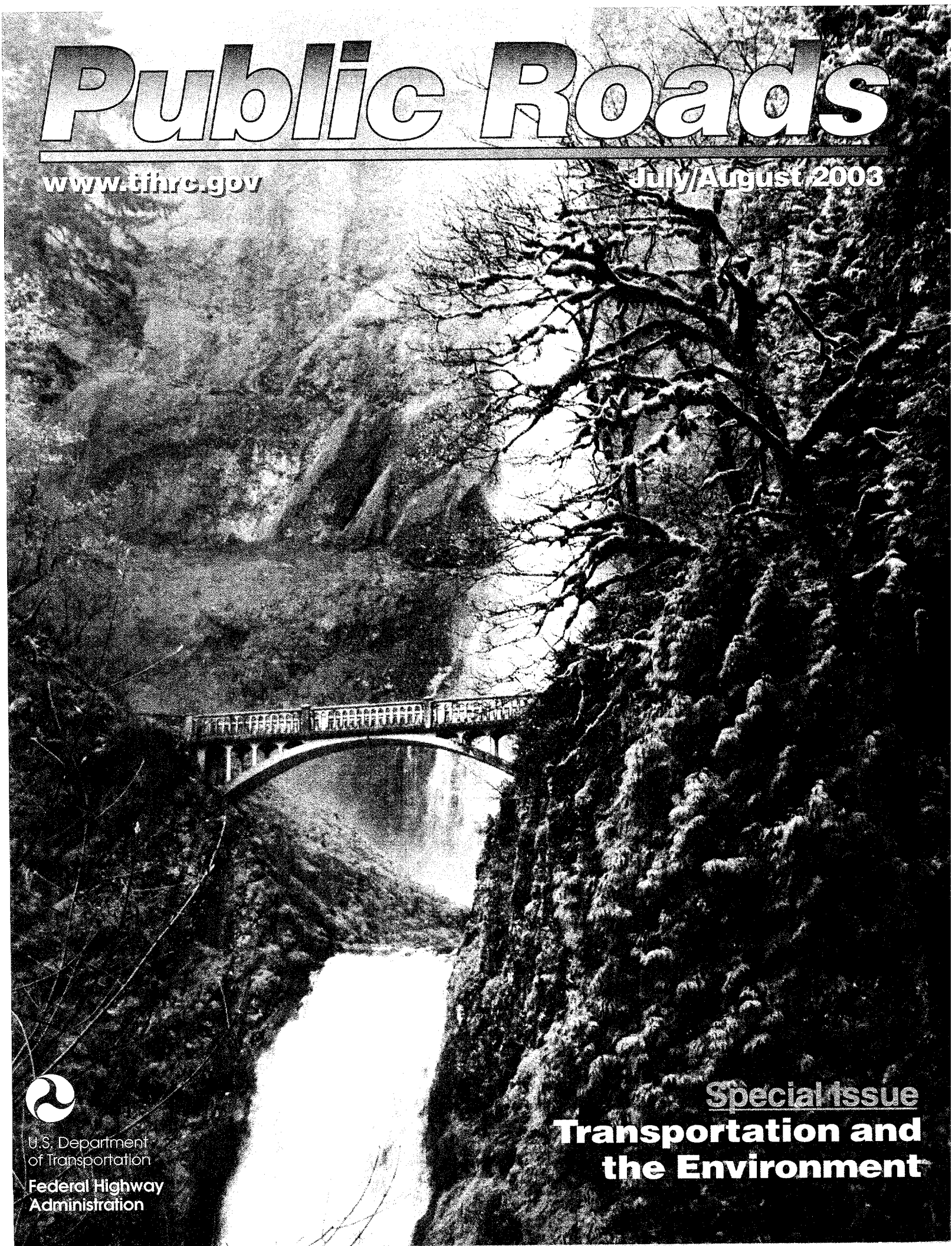

Special Issue

## Transportation and the Environment

U.S. Department of Transportation

Federal Highway Administration

# Public Roads

*—featuring developments in Federal highway policies, programs, and research and technology —*

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## Articles



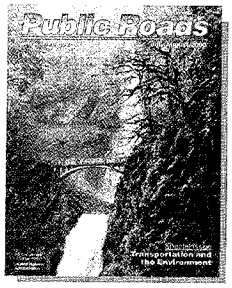
*Page 2*

*Page 18*

*Page 26*

## Departments






**Front cover**—This view of the Benson Bridge over Multnomah Falls was taken from the Historic Columbia River Highway. The waterfall is located in the Columbia River Gorge National Scenic Area approximately 32 kilometers (20 miles) east of Portland, OR. *Photo by David J. Sell, FHWA.*

**Back cover**—Thanks to collaboration by engineers, designers, landscape architects, the community, and the Kentucky Transportation Cabinet, an innovative redesign of a 19-kilometer (12-mile) stretch of the Paris Pike (US 68) through the heart of Kentucky's famed bluegrass region accommodated increased traffic volume and safety concerns while blending the new road into the region's scenic and cultural context. Here, two horses graze in a pasture behind steel-backed timber guardrails along the new roadway. *Photo courtesy of KYTC.*

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# Guest Editorial

## Environmental Stewardship and Streamlining

A few days after President Richard M. Nixon signed the National Environmental Policy Act of 1969 (NEPA), Federal Highway Administrator Francis C. "Frank" Turner addressed a highway interest group. Speaking about NEPA, he said: "Our Nation—whether in its cities or its rural areas—cannot live without transportation, and highways provide the overwhelming proportion of that transportation. But highways can and must be made compatible with and enhance the environment, at the same time that they provide essential transportation service."

His words remain a clear summary of what the Federal Highway Administration (FHWA) is all about. Since the environmental movement became part of the national way of thinking in the 1960s, FHWA has been evolving, along with all other sectors of society, so we can protect the environment while continuing to deliver a resilient and effective transportation system.

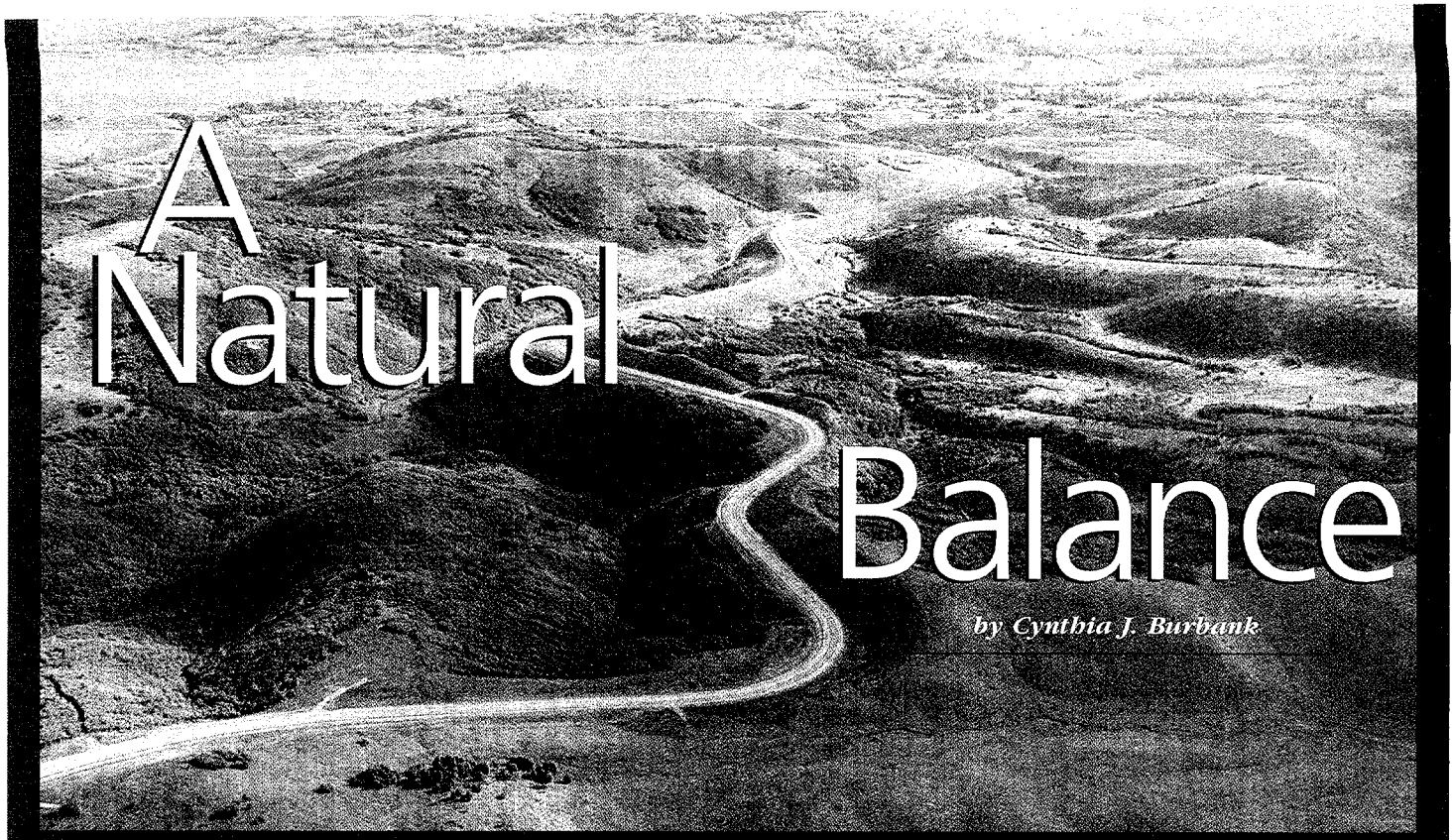
When I became Administrator in October 2001, we identified environmental stewardship and streamlining as one of the FHWA "vital few" priorities (along with safety and congestion mitigation). These priorities are "must do's" for the agency because each one is at the heart of our mission to meet the public's expectations about transportation.

Given how easily debate about important public issues can become polarized, I'm not surprised that environmental streamlining and environmental stewardship sometimes are discussed as if they were code words—as if "streamlining" means shortchanging the review process and "stewardship" means studying projects to death or adding unnecessary, high-cost environmental features. *In fact, environmental stewardship and streamlining are intertwined; we must deliver both. The American public expects Federal, State, and local governments to provide highway, transit, and bicycle/pedestrian improvements that are environmentally sound, that are safe, and that maintain our standard of mobility that is envied by the world. In a joint effort with the Federal Transit Administration, we are doing that.*

As illustrated by this special issue of PUBLIC ROADS, FHWA and its Federal, State, and local partners are employing multiple, creative approaches to synchronize stewardship and streamlining. In this issue, you can read about President George W. Bush's Executive Order on Environmental Stewardship and Transportation Infrastructure Project Reviews, the FHWA initiatives with State transportation departments on streamlining NEPA reviews, and our promotion of context-sensitive design. Other articles discuss such topics as development of transportation projects in delicate ecosystems, mitigation of noise impacts, reclamation of brownfields, making bicycling and walking safer and more practical, and how States can excel in meeting NEPA and other environmental requirements. We also highlight the American Association of State Highway and Transportation Officials (AASHTO) Center for Environmental Excellence.

Collectively, these articles illustrate our commitment to be leaders in transportation, pursuing environmental stewardship and mobility, delivered in a timely way to the American public. As President Bush stated in the Executive order, doing so "is essential to the well-being of the American people and a strong American economy."

Mary E. Peters
Federal Highway Administrator



# A Natural Balance

by Cynthia J. Burbank

***During decades of controversy, FHWA and its State and local partners consistently included environmental stewardship as a goal of transportation projects.***

The 1962 publication of Rachel Carson's classic, *Silent Spring,* about the effect of chemicals on ecosystems, especially bird populations, usually is cited as the start of the modern environmental movement. For the Federal Highway Administration (FHWA), the wake-up call came a few years earlier.

Once construction of the Dwight D. Eisenhower System of Interstate and Defense Highways began shortly after enactment of the Federal-Aid Highway Act of 1956, citizens and local officials from coast to coast began letting FHWA know that they would not accept adverse impacts from the new highways. FHWA was forced to broaden its mission from that of providing highways to meet traffic demand to one that includes reflecting the cultural, economic, environmental, and social needs of U.S. cities and sensitive rural areas.

**(Above) The Utah Department of Transportation, when constructing an improved road between Mountain Green and Huntsville, UT, threaded the highway to avoid as many seeps, springs, and peat bogs as possible.** *Photo courtesy of Utah DOT.*

Since the start of the interstate era, FHWA has evolved into a different kind of agency than it used to be. Early on, the question was: How can we build interstate highways fast enough to complete the program by the early 1970s? By the time that President Richard M. Nixon signed the National Environmental Policy Act (NEPA) on January 1, 1970, FHWA had to answer a very different question: How can we build our highways while minimizing or eliminating damage to the environment? Then, by the 1990s, FHWA expanded its mission to include protecting and enhancing the environment.

## The Good News

Over the past 30 years, FHWA cooperated with State transportation officials to add a number of environmentally sensitive interstates to the system. (See "New Wonders of the World" on page 3.) In addition, the agency joined with State and local officials to complete thousands of environmentally sensitive projects on highways that are not part of the interstate system.

Other good news: Urban highways carry more people to and from work every day than any other means of transportation in history. At the same time, they have accommodated significant increases in population and motor vehicles over the years.

The Nation's air quality has improved steadily since the early 1970s in every category, across the board, in virtually every part of the country. A majority of the areas designated as nonattainment (that is, areas that do not meet air quality standards) since 1990 now meet national air quality standards. Air quality monitoring data through 2001 show that 77 out of 78 carbon monoxide nonattainment areas, 73 out of 85 coarse particulate matter ($PM_{10}$) areas, and 69 out of 101 ozone areas no longer show air pollution levels that exceed the national ambient air quality standards. Even in areas where air quality is rated "severe," it is still better today than it was in 1970.

Since 1991, governments at all three levels spent a total of more than $3.7 billion on transportation enhancements, such as provision of facilities for bicyclists and pedestrians, scenic byways, and preservation of historic transportation structures and facilities.

In part because of transportation enhancements, Federal-aid funding

for bicycle and pedestrian projects increased from $3 to $4 million per year in the 1980s to an annual expenditure of approximately $415 million today. These figures reflect decisions by State and local officials around the country to make bicycling and walking a larger part of our transportation network.

What's more, FHWA is partnering with the State transportation departments and environmental organizations to promote context-sensitive solutions. This concept—transportation improvements that are designed in cooperation with communities and stakeholders to "fit" the values and needs of adjacent neighborhoods and environmental features—is transforming how highway projects are conceived.

State and local transportation agencies and FHWA have learned how to build highways to protect and enhance our waterways, minimize harm to endangered and threatened species, reduce impacts to ecosystems, and moderate the effects of traffic noise.

Wetlands acreage affected by Federal-aid highway projects today is replaced at a rate of 2.7 acres (1 hectare) to 1 acre (0.4 hectares), well above the target level of 1.5 acres (0.6 hectares) for each acre lost. Since 1996, the Federal-aid highway program has provided a net gain of more than 20,000 new and restored acres of wetlands nationally.

All this was accomplished while pavement and bridge conditions improved, traffic volumes tripled, and U.S. highways became safer than ever.

In short, FHWA and its partners in State and local governments achieved a 30-year legacy of meeting highway transportation demands with environmental sensitivity. But the past three decades also were a learning process for FHWA and its partners—not too surprising, really, since our Nation as a whole and the world were experiencing a similar learning curve.

## New Wonders of the World

Although the interstate system is sometimes criticized for its "cookie-cutter" look, many interstates feature one-of-a-kind designs carefully blended into the environment. The following interstates are among those that overcame technical and environmental challenges to emerge as wonders in their own right:

- Parks planted over depressed sections of I–10 in Phoenix, AZ, and I–90 in Seattle, WA.
- World-class scenic byways on I–70 through Glenwood Canyon in Colorado, I–90 across Washington State, and H–3 in Hawaii.
- Signature bridges such as the Sunshine Skyway across Tampa Bay, FL, and the Leonard P. Zakim Bunker Hill Bridge in Boston, MA.
- World-famous tunnels on I–70 in Colorado and I–95 in Baltimore, MD.
- Highways that highlight recreation (the Chain of Lakes along I–80 in Nebraska), outstanding geography (I–70 through Colorado's Hogback and I–68 through Sideling Hill in Maryland, I–15 through the Virgin River Gorge in Arizona and Utah, I–10 across the Atchafalaya Swamp in Louisiana), and coexistence with endangered species (panther crossings on I–75/Alligator Alley in Florida).
- Urban highways suited to the location (I–35E in St. Paul, MN; I–66 inside the Capital Beltway in northern Virginia; and I–476, the Blue Route, in the Philadelphia area of Pennsylvania).

The environmental document for I–80 through Emeryville, CA, called for development of public open space and the amenities pictured here: a multiuse pedestrian and bicycle trail, concrete planter walls with ample seating, and an access ramp meeting current requirements under the Americans with Disabilities Act.

## National Environmental Policy Act

The importance of NEPA to the history of the Federal-aid highway program—and its future—is difficult to exaggerate. FHWA worked with the States during the 1960s to address mounting concerns about highway development, especially in cities. In the 1970s, all parties accepted NEPA as a reasonable framework for taking up the issues specific to each project. The legislation also provided the framework for addressing other Federal environmental laws, which total more than 40 today.

When the highway community realized that it would be required to comply with NEPA, the highway builders had a hard time accepting that business as usual would have to change. As a former Illinois highway official recalled, "You were dealing with engineers [who], for one, didn't have any environmental training in their formal education; and they were told for so many years 'get that thing built.'" After NEPA, he said, the engineers were saying "get that bit out of my mouth, let me get this thing done."

Some controversial highway projects, including more than 547 kilometers (340 miles) of interstates, were eliminated mainly because they were unable to pass the NEPA test. Other controversial highways were built, but in ways that mitigated or


Drainage work for Route 99 in northern Rhode Island resulted in the State's creation of a freshwater wetland used by waterfowl, wading birds, muskrats, songbirds, and other wildlife.


The final design of the I–35E parkway in St. Paul, MN, integrated the road into the urban environment. Noteworthy features shown here include textured retaining walls with planting terraces, ornamental design of railings and lighting, and other streetscape elements.

eliminated the social, environmental, and economic concerns identified during the NEPA review.

Experience taught the highway community an increasing number of ways to reduce the "footprint" of highway and bridge projects while enhancing the environment in many cases.

As the comment about getting the "bit out of my mouth" suggests, the big fear was that NEPA and the growing number of environmental requirements would create red tape that would block needed highway projects. For that reason, finding ways to streamline the NEPA review became a priority. In fact, when FHWA and the Urban Mass Transportation Administration—now the Federal Transit Administration (FTA)—released their joint NEPA regulation in September 1987, they announced that it would "streamline environmental requirements" and "eliminate some of the red-tape and time-consuming legal processes" involved in NEPA compliance.

Experience with timing under the FHWA-FTA regulation was mixed. For example, 97 percent of projects are advanced relatively quickly without a full environmental impact statement (EIS). Thousands of projects every year require little or no NEPA review because they qualify as categorical exclusions. That is, they fall into a category of projects that, based on experience with similar actions, does not involve significant environmental impacts.

On the other hand, environmental impact statements for major projects can take 5, 6, 7 years or even longer. FHWA thinks that is too long. Stakeholders—whether they are for or against a proposed project—deserve an end to the process sooner rather than later.

The Transportation Equity Act for the 21st Century, approved in 1998, made environmental streamlining a national priority. This renewed national emphasis resulted in a series of initiatives that are helping FHWA and its partners identify ways of streamlining the NEPA process. Elsewhere in this issue, Ruth Rentch ("Nurturing an Environmental Perspective" on page 6) and Kreig Larson ("The Road to Streamlining" on page 10) discuss these initiatives. In addition, Fred Skaer describes how the U.S. Department of Transportation is implementing President George W. Bush's Executive Order on Environmental Stewardship and Transportation Infrastructure Project Reviews issued September 18, 2002 ("Executing the Executive Order" on page 14).

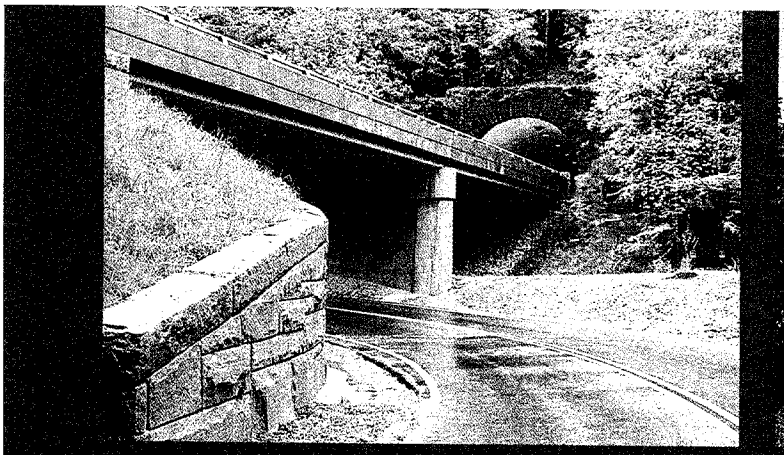
One of the lessons to emerge from years of experience with NEPA is that highway builders must "think beyond the pavement." As Federal Highway Administrator Mary E. Peters says, "A transportation facility is an integral part of the community's fabric, and it can help define the character of the community or it can destroy it."

This realization, one of the legacies of NEPA, is reflected in the changing mix of personnel in highway agencies today. Although engineers remain a strong force, State departments of transportation (DOTs) also hire arborists, archaeologists, biologists, botanists, ecologists, landscape architects, noise specialists, planners, and other specialists who are essential to the NEPA reviews. As a result, State DOTs now may have as much or more environmental experience in certain areas as do their environmental counterparts in other State agencies.

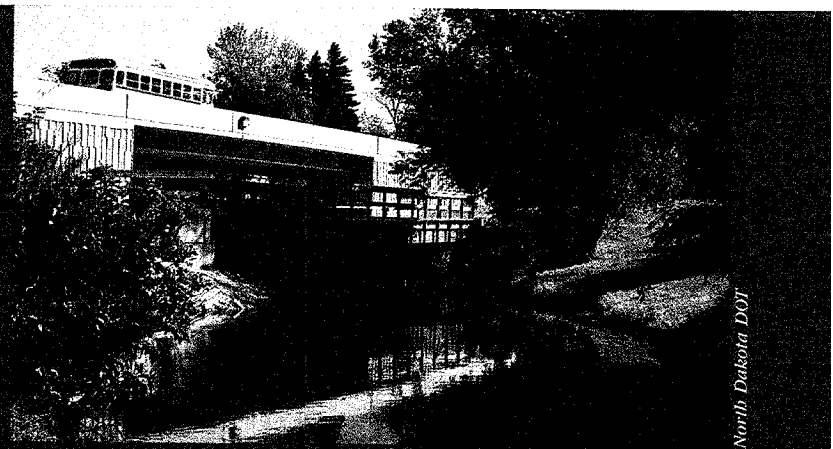
## Context-Sensitive Solutions

The emergence of context-sensitive design in recent decades reflects the evolution of transportation demands and solutions. In the past, projected traffic demands or "throughput" per lane sometimes dictated solutions that harmed the natural and built environments. Context-sensitive design focuses attention on techniques for considering the total context of a transportation project. This approach involves a collaborative, interdisciplinary effort by all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic, and environmental resources, while maintaining safety and mobility.

The phrase "maintaining safety and mobility" is critical. Our Nation is growing—in population, jobs, leisure activities, and travel demand. FHWA and its State and local partners must increase U.S. surface transportation capacity through expanded transit, bicycle and pedestrian facilities, smarter operations—and, yes, through expanded highway lane capacity. Through context-sensitive design, FHWA and its partners can improve existing facilities; incorporate biking, walking, and transit improvements; *and* expand operational and infrastructure capacity, while retaining, even enhancing, the



This spur connects I–40 with the Great Smoky Mountains National Park in Tennessee. FHWA lowered the roadway grade to accommodate two-lane eastbound traffic, solving a problem of limited vertical clearance through the existing tunnel.



North Dakota DOT

The North Dakota State Highway Department built a pedestrian bridge on the campus of the University of North Dakota, using the deck of the old bridge and raising the roadway to provide an aesthetically pleasing way for students to pass safely from one side of University Avenue to the other.

fabric and character of the surrounding environment.

The planned reconstruction of US 93 through Montana's Flathead Indian Reservation illustrates how context-sensitive design can lead to unexpected solutions. In the Montana project, transportation and tribal officials reached agreement on highway improvements that meet modern needs while respecting Native American culture. "We got away from this notion that the road is the important thing. The road is the visitor. You've got to be mindful that there's a history to be respected. What matters is not how you can go through things, but how you can make the highway fit," says consultant Jim Sipes. (For more information on the US 93 project, see "A Hallmark of Context-Sensitive Design," PUBLIC ROADS, May/June 2002.)

Although context-sensitive design employs techniques developed over the years, the current initiative pulls those practices together to help transportation agencies think in a new way about how to meet old problems. The current concept emerged through the work of the member States of the American Association of State Highway and Transportation Officials (AASHTO), particularly the Maryland DOT, in cooperation with Federal agencies (FHWA, FTA, and the U.S. Environmental Protection Agency), and a wide range of environmental, planning, and preservation groups, including the National Trust for Historic Preservation, the Surface Transportation Policy Project, and Scenic America.

Maryland showcased context-sensitive design during a conference in May 1998. Since then, AASHTO, FHWA, and its partners have participated in several national and international meetings on context-sensitive design. Today, five pilot States—Connecticut, Kentucky, Maryland, Minnesota, and Utah—and the FHWA Federal Lands Highway Office are using the concept to balance transportation needs with the environmental and aesthetic concerns of communities. The experience in these efforts is providing important lessons that are spreading to other States.

Lori Irving, in her article on "A New Approach to Road Building" (page 18), describes some of the efforts underway to spread the word about context-sensitive design. In many ways, however, the projects themselves are the best advertisements.

## A New Balance

The launch of the Dwight D. Eisenhower System of Interstate and Defense Highways in 1956 inspired several generations of engineers to work on what has been called the "greatest public works project in history." The controversies that soon emerged on individual projects and their effects on U.S. cities and the environment came as a shock.

With the interstate program essentially complete, many decades of controversies haunt the ongoing debate about the American 21st century transportation system. One result of those stormy years is that FHWA and the State DOTs embraced the environmental ethic that began to emerge in the 1960s. The integration of transportation modes, the value of bicycling and walking, the preservation of ecosystems, the importance of public involvement, the improvement of air quality, the restoration of historic and cultural resources—these concepts and more became a routine part of meeting transportation demand.

The debate over the effects of transportation decisions on U.S. society will continue. Controversies over individual projects are inevitable. The transportation community can never stop learning. But as engineers and others continue to develop the transportation network that America needs to meet the challenges of the 21st century, environmental stewardship will continue to play a guiding role in FHWA's work.

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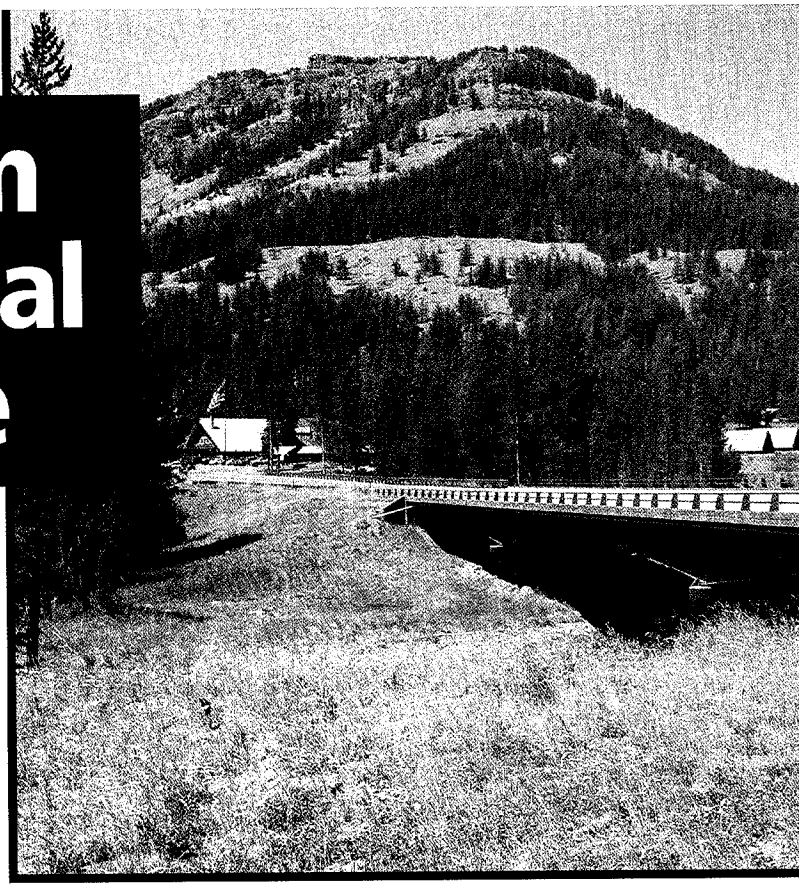
**Cynthia Burbank** is associate administrator for planning, environment, and realty for FHWA. Prior to joining FHWA in 1991, she held positions in the Federal Aviation Administration, FTA, the Office of the Secretary of Transportation, and the U.S. Navy. Her multimodal experience also includes working for Amtrak, the Vermont Department of Motor Vehicles, and the Washington Metropolitan Area Transit Authority, and a volunteer role with the Washington Area Bicyclists Association. She attended Duke University and Boston University, and received a bachelor's degree in economics from Georgetown University, Phi Beta Kappa and magna cum laude.

# Nurturing an Environmental Perspective



*by Ruth Rentch and Rachael Barolsky*

***A scan tour of seven States sheds light on best practices for honoring environmental commitments in transportation projects.***

When developing a transportation project, the sponsors of the project identify and analyze the impacts on the natural and human environment. They outline how they plan to mitigate those impacts through environmental commitments, incorporating these into documents required by the National Environmental Policy Act (NEPA) or in the mandated permits for the project. Such commitments, clearly delineated in the final NEPA decision document or in the permits, must be integrated into the project design, executed during construction, and then maintained during operation.

Successfully implementing environmental commitments is a challenge because often the commitments are made early in the design and planning phases, but the information is not conveyed effectively during the construction and operation phases. Personnel in the State department of transportation (DOT) and contractors responsible for actually building the highway may not be aware, for example, that a project calls for special provisions to minimize runoff or preserve a historic building. The challenge is to ensure that commitments to protecting environmental and cultural resources are honored during construction through continuous communication.

In late 2002, the Office of Project Development and Environmental Review at the Federal Highway Administration (FHWA) sponsored a domestic scan tour to review State practices for implementing environmental commitments. By reviewing successful processes, procedures, and methodologies, the scan team's goal was to provide a framework for helping States benefit from the experiences of other DOTs.

## Participating States

All transportation projects require environmental analyses, but a project's potential impact on the environment often determines the extent of analysis and the types of documents required. Local geography, topography, and demographics are among the factors that influence the determination of specific commitments and the methods for implementation.

The FHWA scan team visited Colorado, Indiana, Kentucky, New Jersey, New York, Texas, and Wyoming. The seven States vary in the size and maturity of their transportation systems and offer a diversity of approaches, proving that success can be achieved in many ways.

## The Scan Team

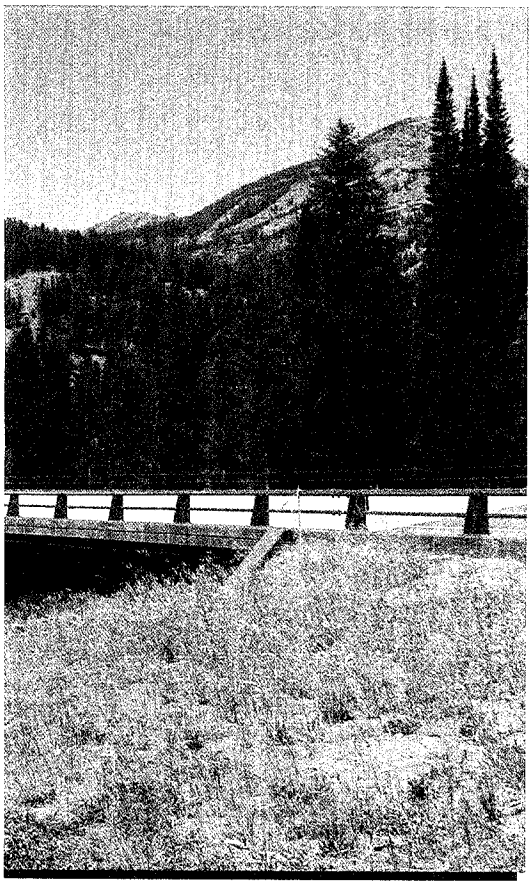
Because the decisionmaking processes for NEPA and issuing permits involves the coordination of many Federal and State agencies, FHWA strived to ensure that the composition of the scan team reflected a cross section of those involved in these processes.

The team consisted of representatives from FHWA's Office of Project Development and Environmental Review, FHWA Division Offices, State DOTs, the U.S. Environmental Protection Agency, the U.S. Department of Transportation's Volpe National Transportation Systems Center, the American Association of State Highway and Transportation Officials, and the American Road and Transportation Builders Association. With expertise in areas from transportation engineering to environmental protection, the team was able to cover a broad range of issues during its State visits.

## Environmental Ethic

After the site visits, the team identified several common themes. The first critical element in implementing environmental commitments is the adoption of a strong environmental ethic that permeates the entire organization. By institutionaliz-

**(Above) WYDOT used native seed mixes to replant the area adjacent to this bridge, which crosses the North Fork of the Shoshone River near the Pahaska Teepee lodge (visible in the background).** *Courtesy of WYDOT.*



ing the commitment, DOTs can ensure that environmental documents and permits are implemented on a continuous basis. When leadership embraces and promotes the ethic, staff at all levels and areas of expertise are empowered to seek out innovative opportunities for environmental stewardship. As a result, stewardship becomes the way of conducting business.

Although adopting and institutionalizing an environmental culture may take years, several States already are experiencing the success that stems from a strong environmental ethic. According to Mary Ivey, acting director of the Environmental Analysis Bureau at the New York State Department of Transportation (NYSDOT), a top-down commitment and a pervasive environmental culture are keys to success.

"New York has had strong leadership with a commitment to doing good things for the environment," Ivey says. "We developed an environmental ethic that changed the culture at NYSDOT. And the longer we have this ethic out in front of people, the more they buy into it and recognize new opportunities in their daily work."

Ivey says that environmental enhancements and best practices offer gains everywhere across the department—from design and construction to maintenance. Projects need not have large price tags. She cites several low-cost environmental projects, such as creating access to fishing sites, partnering with communities to add street amenities (decorative fences, historic lighting, etc.), building fish ladders to facilitate upstream migration, and planting flowers in highway rights-of-way.

"One of the favorites around here is that we are building nesting boxes for peregrine falcons on bridges and scheduling construction work to avoid disrupting nesting females," she adds.

## Staffing

Transportation staff members must understand the importance of environmental commitments. Many States have developed staff positions focused solely on environmental compliance. Most often, States introduce the position of environmental coordinator during a project's development phase, yet realize the full value of the position when the responsibilities extend into the construction and maintenance phases.

The Texas DOT (TxDOT), for example, initially managed environmental commitments in the environmental affairs division, but found that staff members in the maintenance and construction offices were not reading and understanding the information in the same ways.

"After meeting with construction and maintenance staff," says Dianna Noble, director of environmental affairs at TxDOT, "we realized that we needed to find new ways to ensure follow-through. One strategy was that the director of engineering operations in Austin sent a memorandum to the district engineers in each of our 25 district offices directing them to assign an individual from maintenance and construction to assume responsibility for ensuring that environmental commitments made in the planning and design phases are carried out through the construction and maintenance phases." This ensured that the entire staff was involved in the environmental approach.

## Training

Keeping staff and contractors up-to-date on environmental issues also is important. The scan team observed that many States conduct training for employees in areas that traditionally lie outside their scope of knowledge, such as NEPA training for design and construction engineers.

According to Noble, Texas continuously reviews and updates training courses to ensure that the department relays the most current environmental information to staff at all levels, from designers to maintenance and construction personnel.

"In the past," she says, "the environmental ethic rested solely with people in the environmental field, but that's absolutely not the case now. We don't just stop with an introduction to environmental issues; we continue developing and offering advanced training courses, always raising the bar as our people gain experience."

FHWA Kentucky Division Office

**(Above) Members of the scan team prepare for their State visits.**

**(Below) This dry stone wall will be reconstructed along Paris Pike, one of the sites visited by the scan team.**

Inviting consultants, contractors, and representatives from resource agencies to participate in training courses and discuss specific issues adds depth and helps ensure a more complete understanding of the environmental commitments.

## Guidance Documents

In addition to training, pertinent information must be accessible to practitioners. State DOTs prepare guidance documents in many different formats. The key to effectiveness is that they are reader-friendly, accessible to the appropriate staff, and provide relevant information.

- Several States rely on *pocket guides* for use onsite. Small, portable, and accessible to DOT field staff and contractors, pocket guides can educate project staff and assist with specific resource issues in the field.
- Providing more detailed information than pocket guides, *guidelines and manuals* explain requirements and regulations while emphasizing the State's initiatives for complying with commitments. Manuals and guidelines may be issue-specific, such as focusing on endangered species or erosion control, or they may detail a procedural function.
- Many States have begun to use *videos* to describe guidelines and regulations in a manner that may be more appropriate for their audience.

## Commitment Assurance

Cradle-to-grave communication during transportation projects enables States to create a variety of approaches to assure that commitment guidelines are understood throughout planning and design and into construction and maintenance. Detailing the environmental commitments in the NEPA documents is only the first step. Planning sheets and commitment summaries are two mechanisms that, when used properly, can communicate commitments in detail. Forms, meetings, and field reviews also are effective means of ensuring that commitments are transmitted to construction and maintenance staff.

## Tracking Mechanisms

The most effective and efficient means to ensure that environmental commitments are communicated from one phase of a project to another is the use of tracking mechanisms. Many States have developed databases, forms, and lists to monitor implementation and ensure good communication among departments.

Databases provide a clearinghouse for project information including documentation, status of implementation, and records of completion of environmental commitments. They are useful tools that include all phases of the project through maintenance. Using a Web-based system for environmental audits that tracks projects and their major milestones assures consistency in statewide environmental information and implementation of commitments.

Forms are a static type of tracking used to follow a project's commitments through its lifetime. Forms ensure that information is implemented, not forgotten, but their success depends on consistent transmission from one project phase to another. Including a summary of mitigation commitments in both the NEPA document and the plans is one means to ensure implementation.

Lists often are used to track commitments to protect specific resources like cultural artifacts or endangered species. A State should use a variety of lists to delineate the commitments made for each resource affected by a project.

## Public Involvement

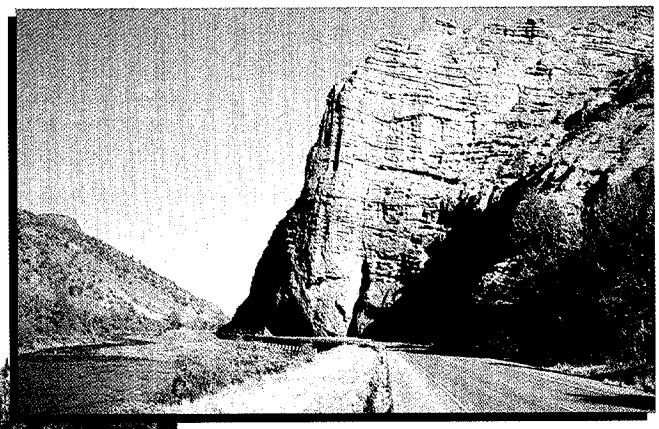
Any final decision on a transportation project must consider the best interests of the public. FHWA requires transportation agencies to involve the public in an open, cooperative, and collaborative process throughout all stages of a project.

According to Timothy Stark, an environmental services engineer with the Wyoming Department of Transportation, the department recently revamped its system for public involvement. The department expanded and decentralized responsibility for communicating with the public by assigning field contacts—known as public involvement coordinators—in each district office.

"When a citizen contacts us with a question about a project, I pass the information along to the local public involvement coordinator in the field office for followup," Stark says. "That followup could entail a phone call or even a personal visit to talk with the caller. In the past, we couldn't have done that."

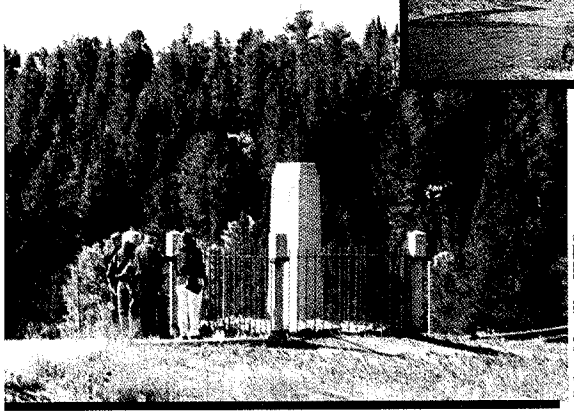
The public appreciates the extra effort. "Since we reorganized our process for public involvement in fall 2002," Stark says, "we have received numerous calls from the public, not with comments on any particular project, but simply expressing appreciation for our new way of doing business."

Another aspect of public involvement is context-sensitive design,



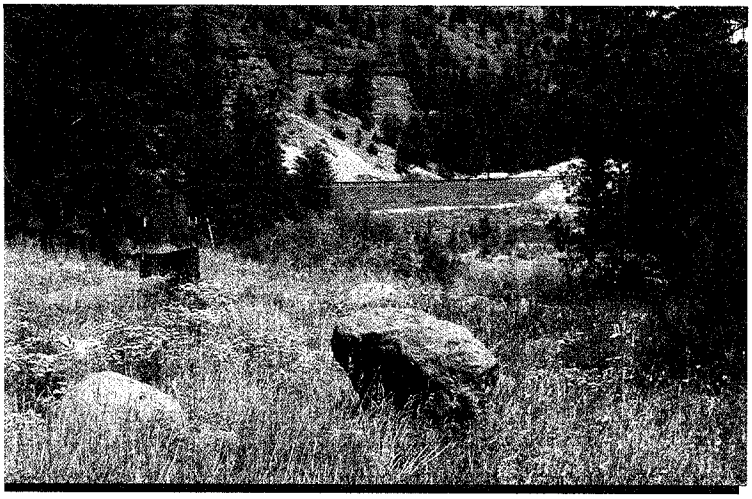
WYDOT

**This photo of Wyoming's rocky landscape represents a clear example of the interconnectedness of transportation and the environment.**



John Mettille, KYTC

**At a rest stop on I–80 in Wyoming, the scan team visited this monument overlooking the original Lincoln Highway.**



WYDOT

**Looking east across a bend in the North Fork of the Shoshone River in the Goff Creek area. WYDOT constructed all the bridges and retaining walls along the US 14–16–20 highway to fit in with the existing terrain and avoid impacts on the river. Designers selected the wall color to match that of nearby rock formations.**

which involves engaging all stakeholders in a collaborative, interdisciplinary approach to developing a transportation facility that considers the total context within which the project will exist. (See "A New Approach to Road Building," page 18.)

## Interagency Coordination

State DOTs must build credibility and trust not only with the public, but also with other Federal and State agencies. Each State DOT visited during the scan recognized that it is essential to receive input and agreement from resource agencies on proposed environmental commitments. Early and continuous communication with other agencies will help identify and resolve issues relating to a project. Through interagency meetings, programmatic agreements, and memoranda of understanding, DOTs and resource agencies have developed both issue-specific and process-wide approaches.

## Recommendations

Based on the lessons learned during the scan, the team recommends five best practices:

*Proactive efforts at all levels of an agency.* Instilling stewardship in an agency requires both top-down and bottom-up approaches. When DOT leadership adopts an environmental ethic, the agency should encourage staff from all divisions to demonstrate the same environmental awareness. When staff members understand environmental impacts and their consequences, they adopt an increased sense of responsibility for a project's environmental impacts.

*Cradle-to-grave communication.* Beginning with the project development and design stages, and continuing on through construction and maintenance, commitments should be communicated clearly among all project staff. Other tools may include specific documentation, agency initiatives, and tracking mechanisms. Although placing environmental coordinators in each district office may be resource-intensive, this practice helps ensure the successful implementation of environmental commitments.

*Education and training.* Staff members at State DOTs first must understand and believe in the importance of compliance before they can demonstrate an environmental ethic. Education and training will help employees and contractors recognize problems and know how to avoid or mitigate them. Accessible and updated documentation (e.g., manuals and guides) also facilitates addressing specific issues effectively.

*Strong stakeholder relationships.* For a project to be successful, stakeholders must support a DOT's efforts and strive to reach a consensus on implementing the project. Communication with resource agencies, citizen groups, and others must be a priority. Such interaction provides opportunities for stakeholders to develop trust and respect for the agency. DOTs should share their accomplishments with the public and continue to build upon their relationships with constituents.

*Learning from the past.* The best practices showcased during the scan are the products of time, energy, and a strong commitment to the environment. Not all best practices are new techniques; many have been in place for years, but continue to evolve and become more effective as an agency embraces them, learning from failures and building on successes.

Successful implementation of environmental commitments is one important way that State DOTs exemplify environmental stewardship, earn the respect and trust of other Federal and State resource and regulatory agencies, and keep their promises to the American public.

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**Ruth Rentch** is an environmental protection specialist with FHWA's Office of Project Development and Environmental Review in Washington, DC. In addition to being the lead for the domestic scan on environmental commitment compliance, Rentch also is the FHWA headquarters lead for the FHWA Alternate Dispute Resolution system mandated by the Transportation Equity Act for the 21st Century (TEA-21). Her current emphasis on environmental streamlining and stewardship includes maintaining and updating the FHWA Environmental Streamlining Web site; issuing the monthly FHWA newsletter, "Successes in Streamlining"; collecting and disseminating data on transportation project times; and serving as the headquarters contact for several priority projects related to Executive Order 13274. Prior to her present position, Rentch was employed by the Maryland State Highway Administration in the Office of Real Estate. She has a bachelor's degree in biology/education from the University of Delaware.

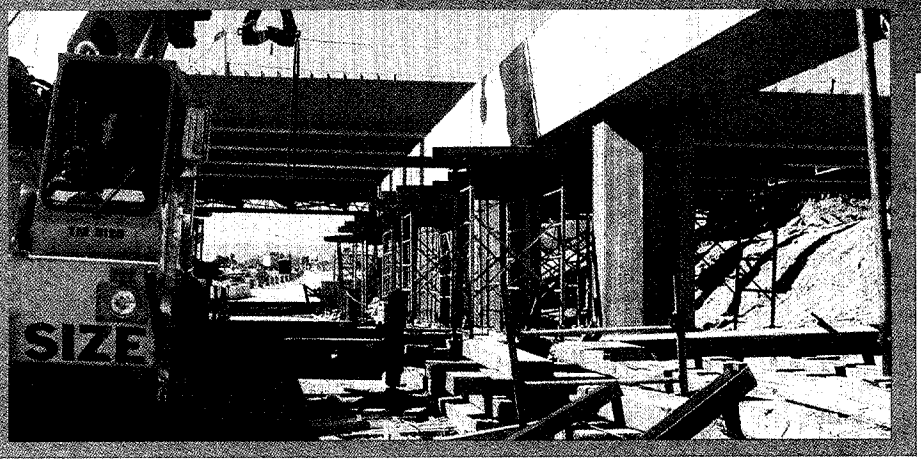
**Rachael Barolsky** is a program and policy analyst with the U.S. Department of Transportation's Volpe National Transportation Systems Center in Cambridge, MA. Barolsky's work focuses on environmental streamlining initiatives and transportation planning efforts within Federal agencies such as FHWA, the Federal Transit Administration, and the National Park Service. Upon earning both a bachelor's and master's degree in energy and environmental policy from Boston University, Barolsky worked at the White House Council on Environmental Quality.

*For more information about incorporating environmental considerations into transportation projects, visit www.fhwa.dot.gov/environment/strmlng/index.htm. For more about the scan tour, contact Ruth Rentch at 202-366-2034 or ruth.rentch@fhwa.dot.gov.*

# The Road to STREAMLINING

*by Kreig Larson*

***An indepth look at the NEPA process and ways to expedite it.***




The National Environmental Policy Act of 1969 (NEPA) marked the beginning of the environmental review process for all Federal actions, including the construction of highway and bridge projects falling under the U. S. Department of Transportation and Federal Highway Administration (USDOT/FHWA). According to the Congressional Research Service *CRS Report for Congress: Environmental Streamlining Provisions in the Transportation Equity Act for the 21st Century: Status of Implementation*, "Numerous stakeholders have expressed long-standing concerns about delays and increased costs for major highway construction projects, which are often attributed to the environmental review process required by the National Environmental Policy Act (NEPA, P.L. 91-190). The substantial amount of time and funding often needed to prepare such documentation for highway projects has been an ongoing issue at the State and local level for many years." This perception is especially the case when the process involves an environmental impact statement (EIS), which is the most comprehensive and time-consuming environmental documentation required under NEPA.

**(Above) This construction work at an interchange in Las Vegas is part of an improvement of US 95 in Nevada, a project where environmental streamlining worked effectively.** *Photo courtesy of Nevada DOT.*

"Good construction projects must move forward promptly, and those unsuited because they would be harmful to the environment, or do not enjoy community support, should quickly and decisively be taken off the drawing board," says FHWA Administrator Mary E. Peters. "To ensure environmental streamlining and stewardship, efficient environmental review processes are a priority."

To this end, Section 1309 of the Transportation Equity Act for the 21st Century (TEA-21) in 1998 directed USDOT/FHWA to "develop and implement a coordinated environmental review process" for highway construction projects. One of the key elements of the coordinated process is the establishment of agreed time periods for the conduct of project analysis, review, opinion, decision, and approval. Section 1309 instructs that review processes be applied to projects requiring either the preparation of an EIS or an environmental assessment under NEPA.

More recently, in September 2002, President George W. Bush signed an Executive order requiring Federal agencies to promote environmental stewardship in the Nation's transportation system and expedite environmental reviews of high-priority transportation infrastructure projects. Similarly, both bodies of Congress have introduced bills designed to streamline the environmental process and expedite project delivery.

But amid the effort to streamline the NEPA process, one critical piece of the puzzle had been missing. The direct effects of NEPA on transportation projects—in terms of time and cost—had not been explored in depth. Without knowing the impacts of NEPA on overall project delivery, there is no yardstick to measure the success or failure of past and future streamlining efforts. Without understanding what has served historically to expedite or slow the NEPA process, effective means of streamlining cannot be identified.

To remedy this lack, FHWA's Office of Project Development and Environmental Review initiated a series of studies to determine how NEPA integrates into the overall process of project delivery and to assess the impacts of the NEPA process on the timing and cost of project delivery. The answers now are becoming clear.

## Defining the NEPA Baseline

One of the studies, undertaken in 2000, provides a better understanding of the impacts of the NEPA process on the total time involved in completing a Federal-aid highway or bridge project. Previously, the portion of time and cost attributed to NEPA requirements versus other potential sources of delay within the overall project delivery process—such as funding shortages, changes in design, contractor delays, lawsuits, and injunctions—had not been well understood. Ultimately, the study aimed to provide a baseline for comparing current and future environmental streamlining efforts within the NEPA process.

The baseline study focused on projects that have been constructed and are fully operating. In total, 100 constructed surface transportation projects with environmental impact statements completed in the 1970s, 1980s, and early 1990s were selected for analysis.

"Compared to previous studies of its kind, the baseline study offered a more comprehensive and less subjective approach to assessing the NEPA process," says Ken Hess, general manager at The Louis Berger Group, Inc., which conducted the study with FHWA. "The NEPA baseline study was designed to be reflective of real data that are as temporally and geographically diverse as possible."

## Key Findings of the Baseline Study

A number of conclusions came to light. The study confirmed a positive relationship between the length of the NEPA process and the length of the total project development process:

- The completion of the NEPA process accounted for approximately 28 percent of the overall time for the project development process.
- The average time to complete an EIS for a transportation project was about 3.6 years.
- The mean length of time for the completion of a project was approximately 13.1 years.
- The average time to prepare an EIS under NEPA ranged from a low of 2.2 years in the 1970s to a high of 5.0 years in the early 1990s.

The project also identified a number of requirements found to influence the length of time required to prepare an EIS. Requirements include Section 404 permits for impacts on wetlands and Section 4(f) provisions pertaining to public parks, recreation lands, wildlife and waterfowl refuges, and historic sites. Two of the requirements appeared to have a statistical relationship to time required to prepare an EIS. It should be noted, however, that another factor—the number of agency meetings held—likely does not have a causal relationship with the time required to prepare an EIS, but rather is more indicative of the complexity of the project.

The full report, *Evaluating the Performance of Environmental Streamlining: Development of a NEPA Baseline for Measuring Continuous Performance,* is available at www.fhwa.dot.gov/environment/strmlng/baseline/index.htm.

## One Step Further: The NEPA Baseline Phase II

The success of the NEPA baseline study in describing the factors influencing the duration of the NEPA process prompted another investigation building on the conclusions of the initial study. The aim of the follow-up research, *Evaluating the Performance of Environmental Streamlining: Development of a NEPA Baseline for Measuring Continuous Performance Phase II,* known as the NEPA Baseline Phase II study, was to determine if the initial study results were repeatable, or if a comparative assessment could be made between the two sets of results.

"The Phase II research expands the development of the baseline NEPA condition to include the more recent past," says Hess. "In this way, a comparison can be made between the earlier and later periods under study."

Although the purpose of the study was the same as its Phase I predecessor, Phase II differed in several important ways:

- Phase II focused only on the NEPA process itself instead of the relationship of NEPA to the overall project delivery process.
- Phase II focused on the two factors identified in Phase I as having a statistical relationship with the length of time of the NEPA process.
- Phase II eliminated the earlier requirement that a project must be completed and open for use in order to be considered and instead included all 244 highway projects requiring environmental impact statements completed between 1995 and 2001.
- Phase II improved upon the "start" date of the project development process, defining it by the Notice of Intent publishing date and thus minimizing subjectivity in the discernment of the dates.

"In combination, the two phases of research essentially tell the whole story since the inception of NEPA," says Hess. "The studies provide a benchmark and a means to identify whether FHWA streamlining efforts are making a difference—today and in future."

## Preliminary Findings of The Phase II Study

Although the NEPA Baseline Phase II study currently is undergoing final review, preliminary results are available. Based on the sample projects analyzed, the Phase II study identified the following trends during the 1995–2001 period:

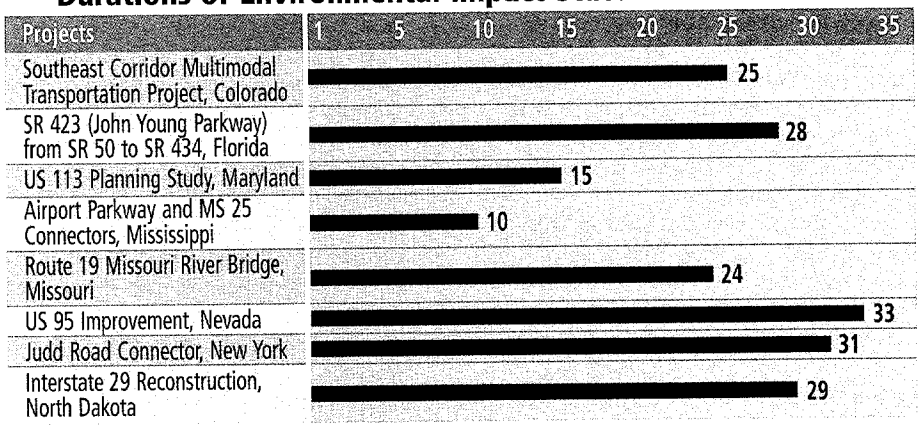
- The average time for preparation and completion of an EIS was 5.1 years, while the median length of time was 4.7 years.
- Projects undertaken in the former FHWA Region 4 (Southeastern States) exhibited the highest mean value (5.6 years of actual NEPA process time) related to the time to complete the EIS process.
- Former Regions 8 (Rocky Mountain States) and 6 (South Central) exhibited the lowest mean values of time (3.8 years) during the study period.
- Although not found to be statistically significant, the requirement of performing a Section 4(f) evaluation for a project may extend the length of the NEPA process by 5 to 7 months, depending on the set of mean values used.

**Primary Requirements Affecting the Length of Time for the NEPA Process (1970s–1990s)**

| Requirements and Other Factors | Average Years Required To Complete EIS |
|---|---|
| Section 404 Permit (Wetlands) | |
| • Needed | 4.3 |
| • Not needed | 2.4 |
| Section 4(f) Approval (Public Lands) | |
| • Needed | 4.7 |
| • Not needed | 2.8 |
| Number of Agency Meetings | |
| • < 3 | 4.5 |
| • 3 | 2.4 |

*Source: FHWA*

**Successful Examples of Environmental Streamlining**
**Durations of Environmental Impact Statements in Months**




*Source: FHWA*

FHWA's Office of Project Development and Environmental Review expects to post the final study on its Web site by June or July 2003. The study will be available at www.fhwa.dot.gov/environment/strmlng/baseline/index.htm.

## Case Studies: Lessons Learned

To assist in future environmental streamlining efforts, FHWA identified eight examples of highway projects that demonstrate successful measures in expedited environmental reviews. The Records of Decision for these eight case studies were approved between 1998 and 2000.

The case studies illustrate that the EIS process can flow at an expedited rate for a variety of project types and diverse settings. What is most interesting about these procedures and techniques is that they are commonsense approaches and do not involve any cutting-edge technologies.

One tip is to capitalize on the extensive project development and analysis performed in studies prepared prior to initiating the NEPA process. Another is to initiate NEPA-type studies in advance of the formal NEPA process. A third technique is to promote interagency coordination and cooperation via formal or informal memoranda of understanding.

Implement early and continuous public involvement programs in an aggressive fashion. Pursue high-level political support for the project. Develop and use State-initiated streamlining programs, and develop procedures for facilitating document preparation and review.

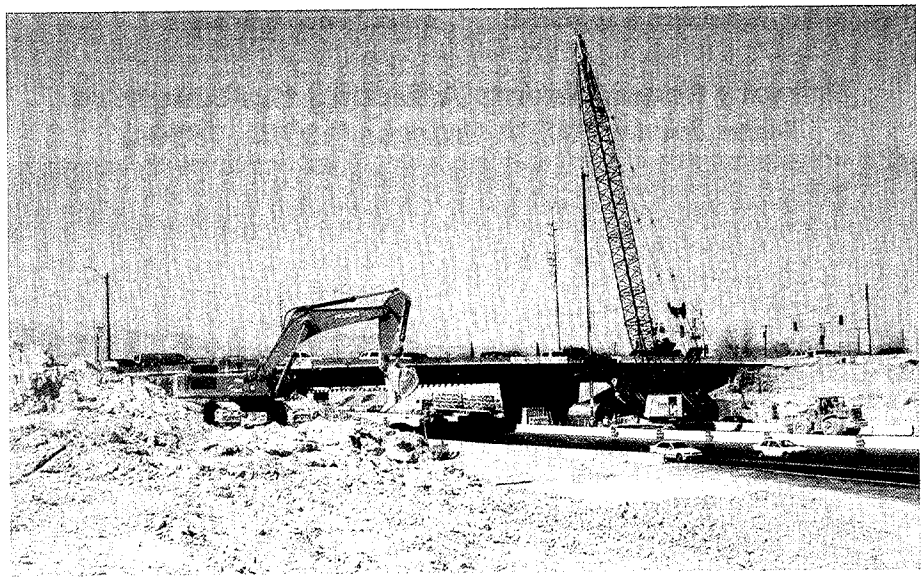
"If properly implemented, the completion of a NEPA EIS does not have to be overly lengthy," says Dr. Tianjia Tang, former project manager for the John Young Parkway project and currently highway engineer and air quality specialist at FHWA's Southern Resource Center. "It can be expedited for all transportation projects by using various procedures and techniques." (See "Lessons Learned" in PUBLIC ROADS May/June 2003 issue for an article about streamlining the John Young Parkway.)

The major findings of the research will be presented in a lessons learned section of the final report, which will describe the procedures and techniques that have streamlined the EIS process in one or more of the cases studied. The report of the eight case studies of successful environmental streamlining is scheduled to be available on the FHWA "Environmental Streamlining" Web site (www.fhwa.dot.gov/environment/strmlng/index.htm) in July 2003.

## National Survey: Measuring Performance Of the NEPA Process

As part of its response to the Section 1309 charge to implement a streamlined environmental process, FHWA contracted with The Gallup Organization to conduct a survey of personnel in transportation and resource agencies to ascertain the perceptions of key participants in the transportation project development process nationwide. The survey will be available in summer 2003. Specifically, the survey will explore how stakeholders in the NEPA process view the duration of the process, the quality of the environmental work and services performed by their counterparts, and areas where improvement may be needed.

Based on a pilot survey, preliminary results suggest that respondents exhibit high rates of satisfaction with the collaborative aspects of the process. The pilot also found that survey participants generally are satisfied with the level of participation by agencies, timely response to requests, and communications. How-



*Nevada DOT*

**FHWA selected the US 95 improvement project in Nevada as one of eight case studies identifying effective means of streamlining the NEPA process. In this photo, a crane is drilling holes for pilings and laying the foundation work for a new interchange.**

The NEPA project development process ensures that efforts are made to preserve and enhance cultural and historic resources near transportation projects, such as this historic structure in Atlanta.

Environmental streamlining is not only about achieving timely decisions for transportation facilities; it is also about environmental stewardship, as demonstrated by this bridge in Chicago, which incorporates environmental landscaping into its design.

Transportation projects have the potential to improve the quality of the natural, social, and built environments, as shown by this parking lot in Chicago, which integrates grass, flowers, and other types of vegetation for aesthetic sensitivity.

*Photos: The Louis Berger Group, Inc.*

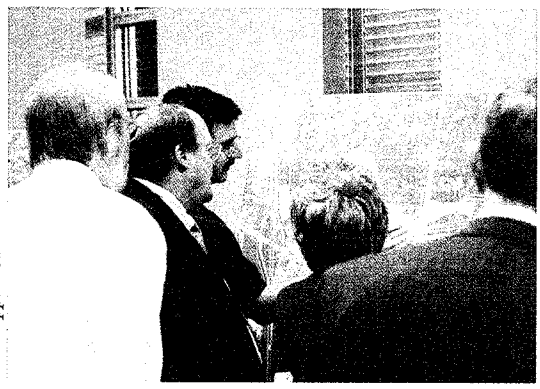
ever, a relatively small number of respondents felt that interagency communications are characterized by the provision of timely updates on progress or a willingness to compromise, indicating that these may be problem areas. Whether these trends will be confirmed in the national survey remains to be seen.

## Moving Forward

The concept of streamlining the NEPA environmental review procedures is not new. As part of its implementing regulations for NEPA prepared in 1978, the Council on Environmental Quality directed agencies to engage in cooperative consultation, integrate the NEPA process into early project planning and review activities, identify significant issues early in the process, and place appropriate time limits on the EIS process.

Yet, after more than 30 years of NEPA compliance, environmental streamlining procedures for federally funded highway projects are applied and implemented on an ad hoc basis. Procedures used to advance projects through the NEPA process vary, to some extent, by FHWA division office or even on a project-by-project basis. The need for a more systematic and efficient approach for environmental review is apparent.

Thanks to public will and government action, environmental streamlining has come to the forefront. Quantitative analyses of the NEPA project development process and practical applications of practices to facilitate a more streamlined process provide useful contributions to further understanding of the time involved in the NEPA process and how it can be reduced. These studies also help with evaluating the performance of streamlining efforts, refining that evaluation, and determining whether opportunities exist to improve the overall process, in spite of other non-NEPA-related factors that may slow project delivery. With a firmer understanding of where we stand today, the NEPA project development process can and will be more effectively streamlined tomorrow.



*Mississippi DOT*

**Cecil Vick of FHWA (left) and Claiborne Barnwell of the Mississippi DOT (center) discuss proposed roadway alignments with local business owners during public hearings held prior to construction of the Airport Parkway and MS 25 connectors—one of the eight FHWA case studies that illustrates how the EIS process can move at an expedited rate.**

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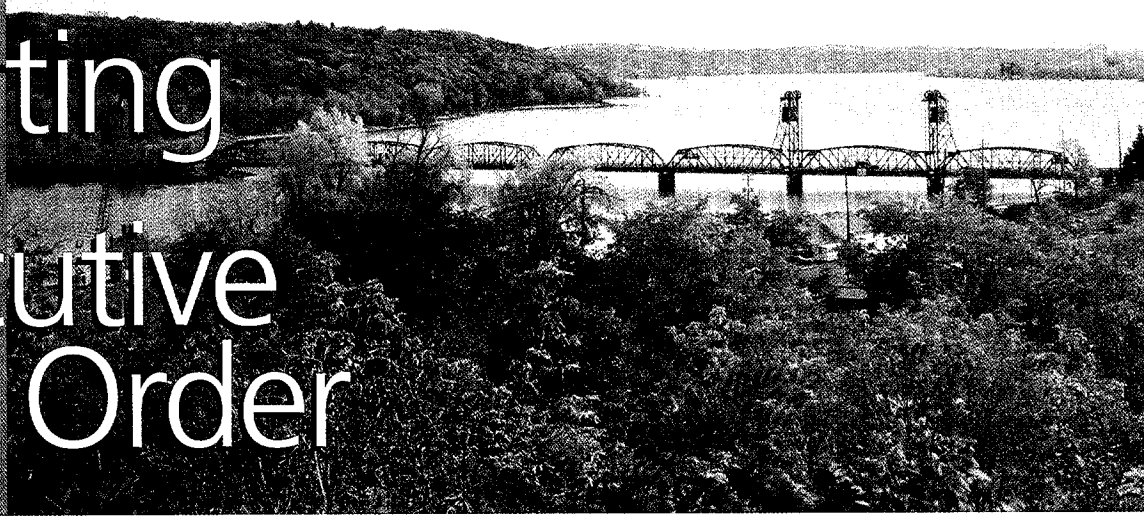
**Kreig Larson** is a project development specialist with the FHWA Office of Project Development and Environmental Review in Washington, DC. He is the technical representative overseeing a number of research projects on environmental streamlining for that office and also is engaged in other FHWA streamlining activities. Prior to joining the FHWA headquarters, Larson was employed as an environmental planner for the California Department of Transportation. He holds a bachelor's degree in soil and water science from the University of California, Davis, and a master's in urban planning from the University of Southern California.

*For more information, contact Kreig Larson at 202-366-2056.*

# Executing the Executive Order

by Frederick Skaer



***Federal agencies today are collaborating more effectively on environmental reviews of major transportation projects, thanks to a new Presidential mandate.***

Executive orders (EOs) are one of the ways that U.S. presidents provide direction to Federal agencies. Unlike a law or a regulation, EOs do not carry the full force of law. Generally they are not enforceable in court, because they deal with issues of how the executive branch operates internally rather than imposing requirements on citizens, corporations, or non-Federal governments. Nevertheless, Executive orders can be a visible and effective way for presidents to communicate expectations to Federal agencies, especially on subjects that require the cooperation of more than one agency.

Since George Washington issued the first EO, presidents have issued EOs on a wide variety of subjects. For example, both the Louisiana Purchase and the Emancipation Proclamation were accomplished by EOs.

On September 18, 2002, President George W. Bush signed Executive Order 13274. Titled "Environmental Stewardship and Transportation Infrastructure Project Reviews," the order directed Federal agencies to collaborate more effectively to advance major transportation projects that undergo environmental reviews and to promote appropriate environmental stewardship by transportation agencies.

In the EO, President Bush states: "The development and implementation of transportation infrastructure projects in an efficient and environmentally sound manner is essential to the well-being of the American people and a strong American economy. Executive departments and agencies . . . shall take appropriate actions, to the extent consistent with applicable law and available resources, to promote environmental stewardship in the Nation's transportation system and expedite environmental reviews of high-priority transportation infrastructure projects."

The EO establishes an interagency task force and directs the Secretary of Transportation to designate a list of priority projects for the group's oversight. The order also instructs the task force to cooperate in developing improved processes for environmental reviews and encourages the Secretary of Transportation to work with Federal agencies and State and local governments to implement stewardship measures throughout the transportation system.

## Interagency Task Force

Under the terms of the EO, U.S. Secretary of Transportation Norman Y. Mineta chairs a task force made up of executives from the other Federal agencies most involved in environmental reviews for transportation projects.

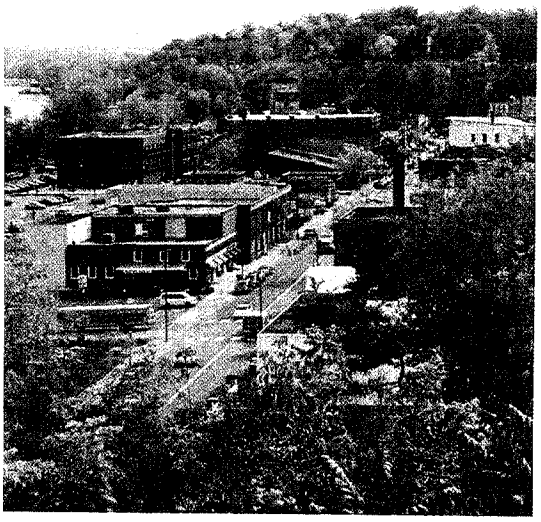
"Too many transportation projects become mired for too long in the complex web of clearances required by Federal and State law," says Secretary Mineta. "This initiative is intended to make our transportation investments more efficient, helping ease congestion and reduce pollution. The President's commitment to environmental stewardship is a key element of this measure. The interagency task force established from this EO will promote common sense streamlining and responsible environmental stewardship in transportation projects."

The EO directs the task force to meet quarterly to monitor progress in advancing priority projects, improving review processes, and working together on environmental stewardship initiatives. Each year the task force must submit a report of its progress through the Council on Environmental Quality to the President.

## Priority Projects

Secretary Mineta is authorized under the EO to select projects to receive priority treatment by the agencies that are the members of the task force. On October 31, 2002, he selected seven projects and then added another six in February 2003. The selections represent highway, airport, and transit projects that are important to the Nation, have strong

**(Above) Congestion in Stillwater, MN, safety issues on the approach roadways, geometric deficiencies, and increasing traffic volumes are a few of the concerns that make the Stillwater Lift Bridge over the St. Croix River a priority project.** *Photo courtesy of Mn/DOT.*



local support, and entail difficult environmental issues involving a number of Federal agencies. Working through contentious environmental concerns in an expeditious way is one of the goals of the EO.

By focusing the attention of field and headquarters officials from the agencies that are involved, the EO is a catalyst for identifying areas of disagreement and creating an urgency to resolve concerns that otherwise might persist over long periods of time. In leading the interagency task force, Secretary Mineta has communicated clearly that the EO will not be used as a way to advance environmentally unsound projects. Instead, the order will help ensure that projects are environmentally sound and receive needed Federal environmental approvals on schedule.

"President Bush asked his cabinet to help States cut through Federal bureaucratic inertia to help them complete sound transportation projects more quickly and at less cost," says Secretary Mineta. "We will not, however, sacrifice environmental standards in this effort."

The priority projects designated to date involve a variety of environmental issues. How to deal with the cumulative and indirect effects of transportation projects is an issue with several of the selected projects. Agencies express differing views about the extent to which environmental studies should predict the likely effects of transportation projects on promoting land development and the resulting environmental impacts. What transportation agencies should do to mitigate environmental impacts also is a point of debate. By identifying recurring issues that affect a number of projects, the task force provides a forum for developing interagency policies that reduce the likelihood of disagreements among frontline field staff.

**Task Force Agencies**

- Advisory Council on Historic Preservation
- Council on Environmental Quality
- U.S. Department of Agriculture
- U.S. Department of Defense
- U.S. Department of the Interior
- U.S. Environmental Protection Agency
- U.S. Department of Transportation

## Lessons Learned

Experience to date with the priority projects points to a number of lessons that can be applied to other projects. Among them are the benefits of elevating disputes rapidly to higher-level officials and engaging neutral facilitators in certain situations. Using priority projects as a laboratory to test innovative processes is a way to learn through experience and transfer that knowledge to other projects.

Although advancing environmentally sound priority projects is worthwhile in itself, a greater benefit comes when the issues raised and lessons learned can serve as a springboard for systematic improvement of policies and practices.

## Improved Policies and Procedures

Major transportation projects can involve compliance with dozens of Federal environmental laws. Each of these laws has its own regulations, policies, and administrative procedures that govern the coordination and decisionmaking process required under specified circumstances. Although the administering agencies attempt to collaborate to establish policies and procedures, the results do not always fit together in a well-integrated fashion. Integrating the various processes is one of the objectives of the EO. Process improvements will result in a streamlined review without compromising environmental compliance.

To date, the task force has focused on three major areas for early attention: the integration of transportation planning and environment; the analysis of indirect and cumulative effects on environmental resources; and the development and review of purpose and need statements for transportation projects.

For each of these three areas, the task force is examining what policies or guidance are needed for process improvements to ensure that Federal agency coordination and decisionmaking is better integrated.

Particularly promising are streamlined procedures for complying with routine situations. By agreeing on processes that provide predictable time frames for transportation agencies and predictable mitigation for environmental and cultural resource agencies, the task force agencies are freeing limited staff from the need to review every routine project. By doing so, they can concentrate staff resources instead on the unusual or difficult projects. Because most transportation projects are small and routine, the accumulated time and staff hours saved by the transportation and resource agencies can be significant.

## Environmental Stewardship

As the title of the EO indicates, it is not just about expediting the delivery of transportation projects, but also about promoting sound practices in environmental stewardship by transportation agencies.

"The President's decision to issue this Executive order," says FHWA Administrator Mary E. Peters, "provides us all with a new opportunity to engage our colleagues in other Federal agencies and in State, local, and tribal governments in enhancing how we do business so that transportation improvements are environmentally responsible and delivered in a timely fashion."

One major effort to promote environmental stewardship among the transportation community is the Center for Environmental Excellence established by the American Association of State Highway and Transportation Officials (AASHTO), with the assistance of FHWA. (See "Centering on Environmental Excellence," on page 32.)

Advancing environmental stewardship in the transportation arena also requires the assistance of environmental agencies and nongovernmental organizations to identify

## Priority Projects*

- California, Los Angeles World Airports Master Plan/EIS (FAA)
- California, Riverside County Community and Environmental Transportation Acceptability Project (FHWA)
- Indiana-Kentucky, Ohio River Bridges (FHWA)
- Kentucky, I–66 (FHWA)
- Maryland, Intercounty Connector (FHWA)
- Minnesota-Wisconsin, St. Croix River Bridge (FHWA)
- Montana, US 93 Corridor (FHWA)
- Nebraska, I–80 Upgrade (FHWA)
- New Hampshire, I–93 (FHWA)
- New York, Lower Manhattan Recovery Effort (FTA)
- Pennsylvania, Philadelphia Airport (FAA)
- Texas, I–69 (FHWA)
- Vermont, Chittendon Circumferential (FHWA)

*FAA: Federal Aviation Administration
FHWA: Federal Highway Administration
FTA: Federal Transit Administration

appropriate opportunities to do good things for the environment. The EO task force provides an ideal forum for turning environmental stewardship ideas into reality. By providing visibility for stewardship efforts underway by transportation agencies, the task force is helping the member agencies promote the benefits of stewardship, create support among frontline staff, and build interagency partnerships that can accomplish much more than individual agencies can achieve by themselves.

Environmental stewardship is making solid headway within the transportation community. It is increasingly being viewed as being both the *right* thing to do and the *smart* thing to do.

"As a public agency, protecting the environment is part of our job," says AASHTO President James Codell. "This means developing transportation programs and projects that truly consider the environment, both human and natural. Most of all, it means doing the right thing every day to make the world a better place for today and tomorrow."

In its "vital few" priorities, FHWA established an ambitious stewardship objective for itself and is looking to the task force for help in meeting that goal. One strategy used by FHWA is promoting context-sensitive design as an environmental stewardship practice. In addition, the agency is fostering integrated approaches, an effort aimed at improving coordination of transportation and environmental planning and project development processes to produce win-win outcomes.

Finally, the agency has set its sights on promoting 30 exemplary initiatives for ecosystems around the country over the next 5 years. Examples include North Carolina's ecosystem enhancement program and western wildlife corridors.

### Ecosystem Enhancement In North Carolina

Faced with an ambitious transportation program that would require environmental mitigation on most projects, the North Carolina Department of Transportation (NCDOT) adopted a big-picture approach as an alternative to project-by-project postage stamp-sized mitigation sites. The big-picture approach, called the Ecosystem Enhancement Program, looks to make strategic investments in large-scale mitigation sites long before that mitigation is needed for a specific highway project.

This approach enables the mitigation dollar to be spent where it has the greatest benefit, and it gives the mitigation sites time to mature and flourish and demonstrate their ecological value before they are used to compensate for project impacts. By removing some of the mitigation guesswork, NCDOT is counting on quicker approvals from environmental agencies.

"Because the EEP [Ecosystem Enhancement Program] will allow us to identify suitable mitigation sites in advance of construction, we will save time and reduce costs throughout the environmental planning process," says NCDOT Secretary Lyndo Tippett. "This will allow us to be better stewards of taxpayer dollars, and at the same time, improve efficiency."

To ensure that the environmental agencies are on board, NCDOT and FHWA worked with them to detail how the process will operate. Federal and State agencies that issue permits, primarily the U.S. Army Corps of Engineers and the State's Department of Environment and Natural Resources, are full partners in this process of reinvention.

Focusing on evaluations at the watershed and ecosystem levels, this North Carolina effort is an exciting initiative in environmental stewardship, one that the EO task force will promote elsewhere in the country.

### Wildlife Corridors Out West

Western States are big! Ecosystems there encompass thousands of square miles, millions of acres, and diverse landscapes. Examples are the Mission Range and Flathead Valley in Montana, which interface to provide essential seasonal habitat for grizzly bear, lynx, mule deer, and elk.

The characteristic wildlife in these large ecosystems often migrate long distances to meet the requirements they have for different habitats at different times of the year. Elk and deer go to their summer and winter ranges, grizzlies and black bears find one area in the spring for foraging and another in the fall for berry feeding. Migratory fish, such as salmon, cover thousands of miles moving

| Law | Resources Protected | Administering Agency | Other Agencies Involved |
|---|---|---|---|
| Clean Water Act (Section 404) | Waters and wetlands | U.S. Army Corps of Engineers | National Marine Fisheries Service<br>U.S. Department of Transportation<br>U.S. Environmental Protection Agency<br>U.S. Fish and Wildlife Service |
| Endangered Species Act (Section 7) | Threatened and endangered species | U.S. Fish and Wildlife Service<br>National Marine Fisheries Service | U.S. Army Corps of Engineers<br>U.S. Department of Transportation<br>U.S. Environmental Protection Agency<br>USDA Forest Service |
| National Historic Preservation Act (Section 106) | Historic and archaeological properties | Advisory Council on Historic Preservation | U.S. Department of Transportation<br>U.S. National Park Service |
| Department of Transportation Act (Section 303 aka Section 4(f)) | Parks, recreation areas, refuges, historic or archaeological properties | U.S. Department of Transportation | U.S. Department of the Interior<br>USDA Forest Service |

from freshwater to saltwater and back again.

Compared to wildlife in the eastern States, western wildlife populations are found at low densities. To maintain their health and numbers, western wildlife populations need the ability to move readily between ecosystems that are far apart.

Highways can form barriers to such movements, even for the largest of species, including elk and large carnivores such as grizzly bears. Wide-ranging species affected by barriers also include salmon as they migrate from the sea into rivers under bridges and through culverts on highway corridors.

Many western State DOTs have initiated research and construction programs to enhance wildlife movements and protect wildlife travel corridors. Wyoming currently is supporting research to determine the best fix for crossings at Nugget Canyon on US 89, where thousands of mule deer cross the road every spring and fall on their way from summer to winter range.

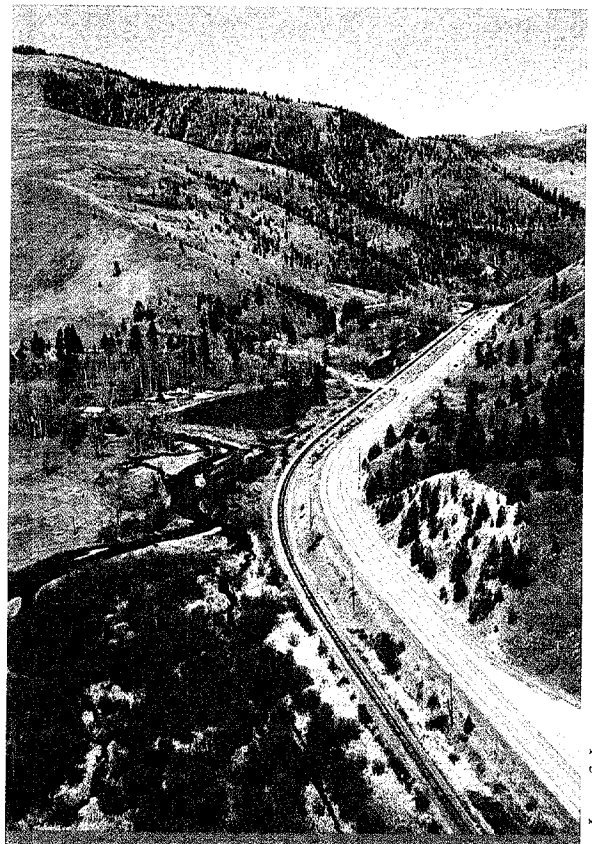
The Washington DOT is working with the National Oceanic and Atmospheric Administration's National Marine Fisheries Service to remove fish barriers that affect the migrations of endangered salmon.

The Montana DOT worked with the Salish-Kootenai Confederated Tribes to design crossings that will enhance wildlife corridors across Highway 93 between Missoula and Kalispell, from the Mission Range over the expanse of the Flathead Valley.

Idaho, with the aid of the U.S. Department of Agriculture Forest Service, designed an upgrade of US 95, a Congressional high-priority corridor, to include three large culverts in a critical habitat linkage area. The culverts will facilitate movements of deer, elk, and grizzlies between seasonal habitats.

Almost every other western State has multiple projects to protect habitat and maintain essential wildlife corridors. But highways are only one part of the corridor question. Wildlife structures on highways are just one point on an often long chain of habitat that can be broken in many places.

Commercial, residential, and agricultural development on adjacent landscapes also can affect the sustainability of wildlife travel corridors. To ensure that the efforts by transportation agencies to facilitate wildlife movements are effective, cooperation by adjoining landowners is critical. Whether the landowners are public agencies or private individuals, they can help maintain the integrity of the travel corridors.



*Jones & Jones*

Recently identified as a priority project for FHWA, the US–93 corridor in Montana (shown here south of Ravalli) passes through the Flathead Reservation of the Confederated Salish and Kootenai Tribes. An interdisciplinary team is designing the new alignment to improve safety while respecting cultural and environmental resources in the region.

## Environmental Streamlining and Stewardship

In the final analysis, President Bush's decision to issue EO 13274 is a commitment to the environment and a commitment to deliver needed transportation improvements in a timely fashion. According to FHWA Administrator Peters, a healthy natural and human environment and mobility of people and goods are things that U.S. citizens expect their government to provide.

"Environmental stewardship and environmental streamlining go together, hand-in-glove," says Administrator Peters. "We can improve processes to make them more efficient and with less duplication, while being respectful stewards of the environment. We can expedite projects and protect the environment. This is what Congress and much of the Nation wants us to do . . . there is enormous frustration with congestion and a desire to have good projects sooner."

For decades, Federal agencies have worked together to address both of these expectations, but the decision-making authority is so dispersed that executive attention is needed in all agencies to make these goals happen. The increased visibility provided by this EO has had a substantial impact already. From all indications, the increased interagency cooperation engendered by the EO is expected to harvest an abundance of innovation in the coming years.

As paraphrased from the opening sections of the National Environmental Policy Act, the goal is to cultivate a truly productive harmony between man and the environment, for the benefit of this generation and future generations.

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**Frederick Skaer** is currently the director for the Office of Project Development and Environmental Review, Office of Planning, Environment, and Realty at the Federal Highway Administration. Skaer has been with FHWA since 1974, during which time he has served in three field divisions and at headquarters in a variety of planning, environmental, and engineering positions. Skaer is a civil engineering graduate of Brown University and holds a master's of public administration from The George Washington University.

*For more information on the EO Interagency Transportation Infrastructure Streamlining Task Force, visit www.fhwa.dot.gov/stewardshipeo/index.htm or contact Fred Skaer at fred.skaer@fhwa.dot.gov.*

# A New Approach to Road Building

*by Lori Irving*

***Can a new policy change the way people think about transportation agencies and the projects they deliver?***

On February 8, 2003, an article in Chicago's *Daily Herald* asks, "Are state road planners becoming wimpy? Highway engineers have dropped or scaled back road widening plans on three suburban projects . . . after hearing complaints from area residents."

The *Daily Herald's* headline tells the real story: "State Engineers Put New Focus on Sensitivity While Working to Relieve Suburbs' Traffic Jams." Recent headlines from around the country focus on a new way of doing business taking root in State departments of transportation (DOTs): context-sensitive design.

According to a Web site sponsored by the Federal Highway Administration (FHWA), "Context Sensitive Design: Thinking Beyond the Pavement," context-sensitive design is a collaborative, interdisciplinary approach that involves all stakeholders in developing a transportation project that fits into its physical setting and preserves scenic, aesthetic, historic, and environmental resources, while maintaining safety and mobility. The context-sensitive approach considers the total context for transportation improvement projects.

Can this new philosophy really change the way people think about transportation projects and the very complex process that delivers them? The answer appears to be a resounding "Yes."

## Defining Context Sensitivity

According to Federal Highway Administrator Mary E. Peters, context-sensitive design means fitting the roadway into the community it serves and accommodating the unique features and attributes of the surrounding area while meeting mobility and

**(Above) The renovated Smith Bridge, which maintains the rural spirit of Centreville, DE, is shown here adding a splash of color to this winter scene.** *Photo courtesy of Leslie W. Kipp.*

safety needs. "The interstate system was largely built with a production mode standard," she says. "Each roadway section was designed essentially the same way. Context-sensitive design is more like a custom-built home as opposed to mass-produced subdivision housing, but not necessarily with the high price tag."

The Delaware Department of Transportation (DelDOT) recently adopted a policy supporting context-sensitive design. The policy sets aside 5 percent of construction costs for improvements to the community or environment immediately adjacent to all road projects. The policy also encourages redevelopment of existing communities, protection of farmlands and critical natural resources, and improvement of mobility based on community needs.

The Kentucky Transportation Cabinet (KYTC), which also embraced context-sensitive design, has begun to share its practices with other State DOTs. In February 2003, in a memorandum to all Cabinet employees, KYTC Secretary James C. Codell III said, "Our customers demand that our projects and activities fit, look good, have balance, and are sensitive to human and natural environments. Therefore, we must continue to change our culture to one that has an environmental ethic and assumes an environmental stewardship role. It is the correct approach . . . the right thing to do . . . the common sense thing to do, and our customers deserve this type of treatment."

Delaware DOT

**The Delaware Department of Transportation reconstructed this historic covered bridge in Centreville to replace the original structure that burned down in 1962.**

## Recent Headlines on the New Way of Doing Business

An article in the *Dayton Daily News* in Ohio bears the headline, "New Bridges, New Looks—Losing the Utilitarian Look." The author writes, "In the 1950s and '60s when roadways were spreading like kudzu to keep pace with the Nation's postwar prosperity, a bridge was seen as the cheapest and sturdiest way to span the distance between two elevated points.

"In the past decade, however, federal, state and local transportation officials have seen the light..."

*The Courier-Journal* of Louisville, KY, applauded the Paris Pike project in an article headlined, "Widened Road Serves as Model for Preserving Historic Character."

Clifford Linkes, manager of the Paris Pike project and deputy secretary of the Kentucky Transportation Cabinet summarizes the improved relationship between the State and residents: "Years ago in the first property owner meetings about the Paris Pike project alignment, the Cabinet was not trusted nor did we have the respect of the people. This was reflected in their tones of conversation and actions. I am very gratified to think how far the Cabinet and all the impacted citizens have come in achieving trust and respect for one another."

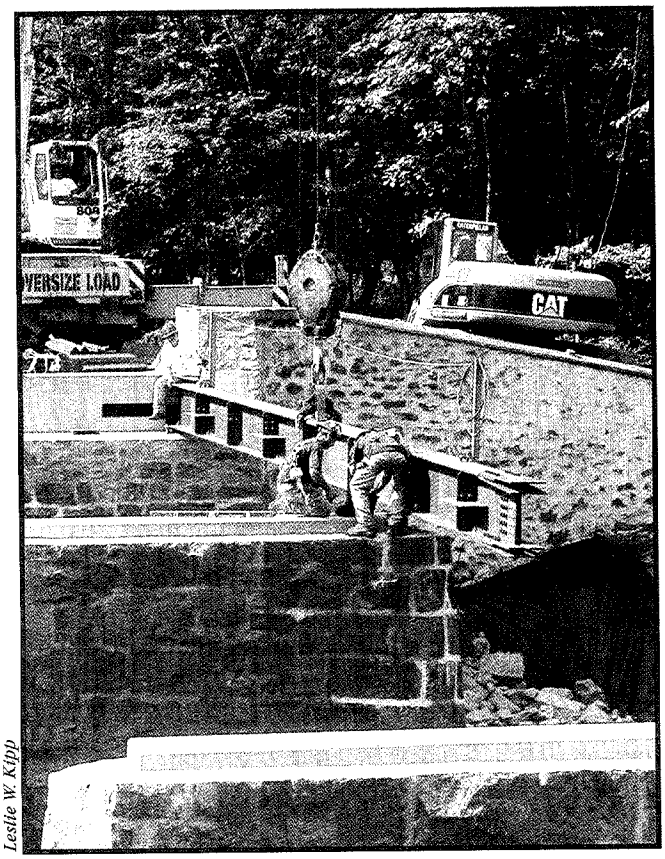
## Changing Public Attitudes

Can context-sensitive design change the way people look at highways and bridges? In a small village in Delaware, it has.

In 1962, fire devastated a covered bridge in Centreville, DE, when someone with little appreciation for the historical importance of the structure burned it down in a Halloween prank gone awry. The one-lane wide, three-span steel beam bridge had a timber deck and railing with a wooden superstructure. The stone abutments that made up the substructure dated back to 1839. DelDOT's original plans for the bridge involved replacing the deck and rehabilitating the substructure.

According to Calvin Weber, project engineer with DelDOT, after proceeding through a very contentious process on an earlier bridge project in the same community, DelDOT was asked to approach the Smith Bridge project with a "blank sheet of paper." "What I was hearing from the community," Weber says, "was that we solicited public input too late in the process, after the scope and type of bridge already was selected. Therefore the community felt their comments had little effect on a project. To address this, we held the first public workshop on April 10, 2000, without plans, that is, the 'blank sheet of paper' concept."

Patt Cannon, president of the Centreville Civic Association, Inc., says that the association worked to convince DelDOT that what the people wanted was feasible and safe. And that initial effort paid off. Once everyone was in agreement that another covered bridge was the answer, work progressed quickly. It was not long before the Village of Centreville was celebrating the




Leslie W. Kipp

**On October 7, 2002, workers lowered the first steel beam into place on Smith Bridge.**

opening of the fully restored bridge over the Brandywine River in 2003.

## A New Spirit of Cooperation

It was not just a bridge that was built. Trust and understanding between a government agency and a small community also were created. To the villagers, the people from DelDOT are not "just" highway engineers any more. They are friends that shared in a successful journey.

According to Cannon, the residents of Centreville were so excited about the ribbon cutting for the new covered bridge that they held a "We Can't Wait for the Bridge to Open" party. Hundreds of people turned out for the opening, including members of the DelDOT staff.

On the Centreville, DE, Web site (www.centrevillede.info), Patt Cannon reported on the official ribbon cutting: "The ribbon-cutting ceremony was wonderful to me. I thought about the time just two and a half years ago when the community came together to tell DelDOT that we wanted a very special bridge here: a one-lane covered bridge, just like the old one. No paved, two-lane, stonewalled version for this spot! And on this day in January 2003, we all—residents, visitors, and transportation planners—were standing shoulder-to-shoulder celebrating our success."

At the end of the bridge opening, after most people had gone home, a few of the people who had made the covered bridge project such a success remained at the site. Cannon reported that one of the DelDOT staff came up and gave her a big hug. When was the last time any official in a transportation agency heard something like that reported of a road project?

## Improving Safety

Context-sensitive design and safety go hand-in-hand. As with other design criteria, safety is a crucial aspect of the context that DOTs consider when planning transportation projects. In the past, highways were designed with the primary objective of assuring safe travel for motorists. Context-sensitive design provides a focus for improving safety for all types of surface transportation and for all users, including bicyclists, pedestrians, and motorists.

Improving the safety of the community where a new transportation facility is being built is an important consideration, and part of what helps ensure community acceptance of the project. Building a safe road and one that also fits into its community are eminently compatible goals.

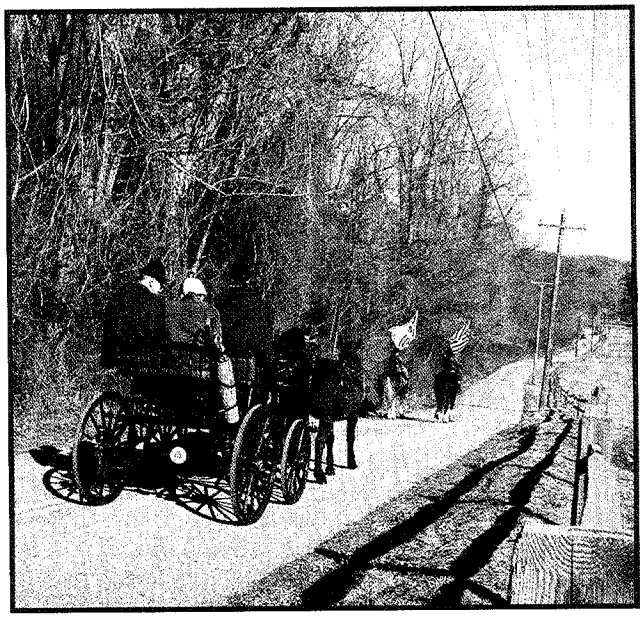
Context-sensitive design focuses on interdisciplinary decisionmaking, involving safety and other design considerations along with capacity increases, citizens' concerns, community impacts, environmental considerations, and historical preservation.

## Cost Considerations

Some might ask, "Won't context-sensitive design cost more money? Can we afford these so-called frills?" Others might say that the real question should be, "Can we afford not to?"

A stretch of road in the oldest, most prestigious part of the Kentucky bluegrass region demonstrates the point perfectly. Efforts to improve the two-lane Paris Pike between Lexington and Paris began in the mid-1960s and ended shortly thereafter. By 1979, a court injunction prohibited further work on the project. KYTC Secretary Codell described the agency's initial attempt at the project as the "DAD method—Decide, Announce, and Defend. It was our way or no way," he says.

Fourteen years later KYTC made another attempt, this time launching a consensus-building effort that



Leslie W. Kipp

**In early January 2003, the Mounted Color Guard of the New Castle County Police led a parade of carriages and antique cars to the Smith Bridge ribbon-cutting event, just 5 months after the start of construction.**

included landowners, architects, highway engineers, historical properties advisers, and a scenic roadway adviser.

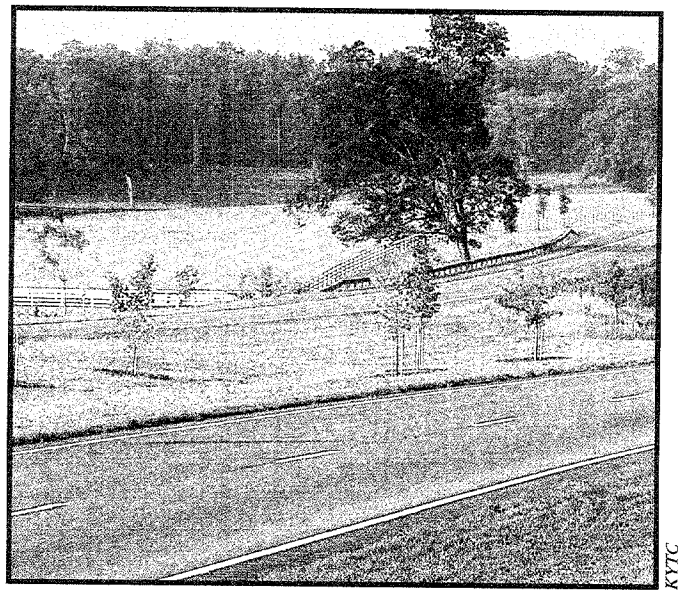
Secretary Codell described this second, successful attempt as "a Publicly Owned Project, or POP." He credits the Paris Pike project as the birth of the context-sensitive design philosophy in Kentucky.

A headline in *The Courier-Journal* reads, "Earth and Eye; Paris Pike Widening Leads Landscape Award Winners." The author reports, "It's like what the Tin Man sings in the 'Wizard of Oz'—you've got to have a heart. The recent widening of historic Paris Pike in Lexington, KY, . . . received the top Award of Honor with Excellence . . . from the Kentucky Chapter of the American Society of Landscape Architects."

The award jury said the topography of the bluegrass region determined the look of the road rather than the road altering the topography.

According to John Carr of the Kentucky Transportation Cabinet, "All of the extras—the wooden guardrails, the grassy shoulders—meet highway design standards and don't compromise safety." He adds, "The project cost about 25 percent more because of the extras, but it was worth it."

Secretary Codell says of the highway, "Now I can take people out and say, 'Look at what we can do.'"



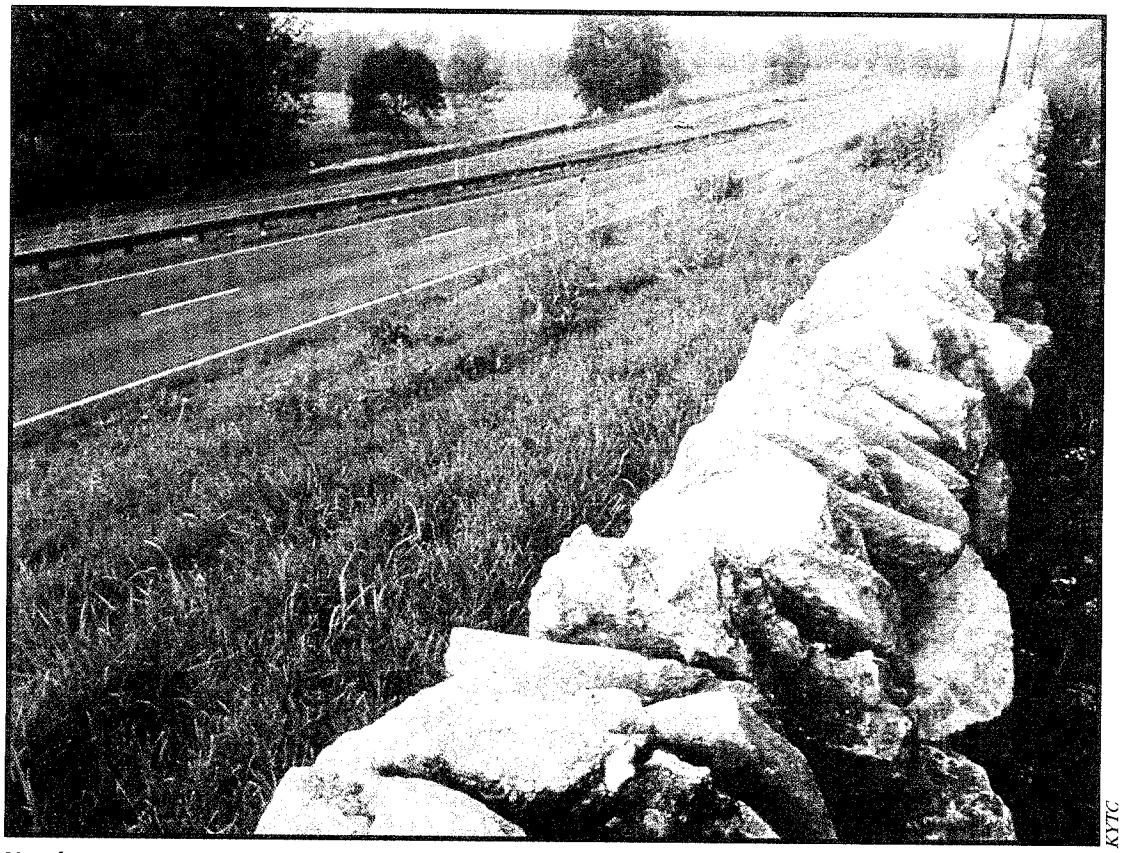
KYTC

**Grass shoulders along the new Paris Pike in Kentucky reduce overall pavement width and lessen storm water runoff. Grass-covered, rather than paved, shoulders create a visually narrower road section that complements the rural setting and is conducive to lower travel speeds.**

## Success in the Details

Back to the original question, "Can a new policy change the way people think about highway projects and the people that build them?" The answer is, "Yes, it can, but on a case-by-case basis."

The policy alone does not ensure success. Delivering highway products that earn the public's favor requires cooperation and teamwork. The day-to-day work and the thoughtful consideration of how that work is carried out will make all the difference in the end.



KYTC

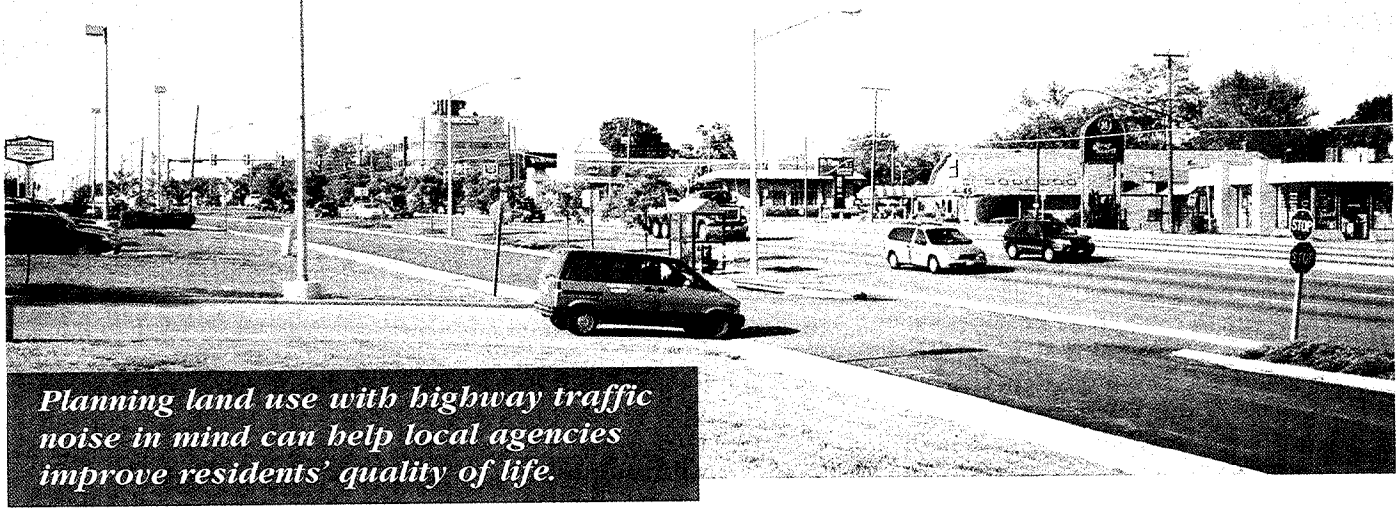
**Newly constructed rock fences like this one along the new Paris Pike are built with the same materials and methods as historic rock fences in the region. KYTC hired Richard Tufnell, a dry stone mason from Scotland, to teach contractors and staff the lost art of dry stone masonry.**

**Lori Irving** is a public affairs specialist with the FHWA Office of Public Affairs. She began her career with FHWA in 1993. Prior to that, she worked in the Office of the Secretary. She currently is the public affairs liaison for the FHWA Office of Planning, Environment, and Realty.

*For more information about context-sensitive design, visit www.fhwa.dot.gov/csd.*

# Living with Noise

*by Chris Corbisier*



***Planning land use with highway traffic noise in mind can help local agencies improve residents' quality of life.***

According to the most recent data available from 1987, noise from highway traffic affects more than 18 million people in the United States. As highway systems continue expanding, increased traffic volumes result in higher levels of traffic noise for residents of adjacent neighborhoods. New residential development typically occurs near roadways because of the ease of traveling to work, school, and leisure and shopping activities. But as open space for new development becomes scarce, must people simply accept increases in highway traffic noise? Not necessarily.

Avoiding a noise problem frequently is more effective than trying to correct an existing one using noise barriers. FHWA encourages developers, government officials, planners, and private citizens to consider ways to address highway traffic noise before—rather than after—frustrating problems arise. One solution is noise-compatible land-use planning.

Through advance planning and shared responsibility, local governments and developers, working cooperatively with Federal and State governments, can plan, design, and construct new development projects and roadways that minimize the adverse effects of noise from highway traffic. Noise-compatible land-use planning encourages the location of less noise-sensitive land uses near highways, promotes the use of open space separating roads from developments, and suggests special construction techniques that minimize the impact of noise from highway traffic.

**(Above) Locating commercial developments near the highway, as with this strip mall in northern Virginia, is preferable to putting a residential neighborhood close to traffic noise.**

## Sound Basics

Acousticians define sound as a sensation in the ear created by pressure variations or vibrations in the air. What qualifies as *noise*, or unwanted sound, tends to be subjective. That is, sound that one person perceives as music may be noise to someone else.

Sound is composed of many frequencies, some of which may affect one person more than another. Because engineers measure sound in decibels (dB) on a logarithmic scale, when two sources of sound, each measuring 70 dB(A), are added together, the resulting sound level is not 140 dB(A) but 73 dB(A). The (A) refers to a weighting scale that approximates the manner in which humans hear higher frequencies better than lower frequencies.

Levels of highway traffic noise typically range from 70 to 80 dB(A) at a distance of 15 meters (50 feet) from the highway. These levels affect a majority of people, interrupting concentration, increasing heart rates, or limiting the ability to carry on a conversation. The noise generated by a conversation between two people standing 1 meter (3 feet) apart is usually in the range of 60–65 dB(A). Most people prefer the noise levels in their homes to be in the 40–45 dB(A) range, similar to the levels found in a small office. A reduction of sound from 65 to 55 dB(A) reduces the loudness of the sound by one half, while a reduction of sound from 65 to 45 dB(A) results in a loudness reduction of one quarter.

## Reducing Noise from Highway Traffic

FHWA recognizes three broad approaches for reducing noise from highway traffic: source control, mitigation measures associated with the design of road projects or their operation, and noise-compatible land-use planning.

Source control in the United States involves regulating and enforcing the level of noise emissions from newly manufactured medium and heavy trucks with a gross vehicle weight rating of more than 4,525 kilograms (10,000 pounds). The level of noise emitted by trucks has decreased by 3 dB(A) in the past 20 years. Noise from automobiles, however, is not regulated.

Road measures to reduce highway traffic noise include restricting truck access and adjusting the timing of

traffic signals. Other options to consider early in the planning stages are depressing the highway (constructing the highway below grade) or moving it farther away from sensitive areas. Constructing a noise barrier (i.e., a wall, an earthen berm, or a combination of wall and berm), however, is the most common measure employed to mitigate noise associated with highway projects.

The third approach, noise-compatible land-use planning, aims to guide residential development in such a way that sensitive land uses are not located adjacent to a highway. Also, neighborhoods and the houses themselves are planned, designed, and constructed to minimize the impacts of traffic noise.

## Benefits of Planning Ahead

Noise-compatible land-use planning can have a positive effect on a community's aesthetics, quality of life, and finances. Land-use planning provides appealing alternatives for reducing traffic noise without the use of barriers, which are more intrusive and visually and physically restrictive. When State departments of transportation (DOTs) or communities use noise-compatible land-use planning to create quiet zones rather than constructing noise barriers, they can use the money saved for additional roadway improvements or maintenance programs.

Many people perceive noise barriers as the best answer to eliminating or reducing the impact of highway traffic noise, and State and local DOTs have constructed many miles of barriers over the years. However, indications are that Federal and State funding for noise barriers may be restricted in the future. In fact, existing Federal legislation already prohibits FHWA participation in the construction of most noise barriers for new development that occurs near existing highways. (See Title 23 of the Code of Federal Regulations, 23 CFR 772.13(b).)

"A lot of municipalities just don't even think about noise," says Eric Zwerling, director of the Rutgers Noise Technical Assistance Center at the State University of New Jersey and president of the Noise Consultancy, LLC, "but the bottom line is that it's much, much cheaper to design for quiet than to remediate afterwards. Spending additional time upfront helps residents avoid disrupted lives and costly retrofits, and could help municipalities and State DOTs avoid the problem and expense of addressing incompatible adjacent land uses."

**Common Outdoor and Indoor Noises**

| Outdoor Noises | Sound Pressures (uPa) | Sound Pressure Levels (dB) | Indoor Noises |
|---|---|---|---|
| | 6,324,555 | 110 | Rock Band at 5 m |
| Jet Flyover at 300 m | | | |
| | 2,000,000 | 100 | Inside Subway Train (New York) |
| Gas Lawn Mower at 1 m | | | |
| | 632,456 | 90 | Food Blender at 1 m |
| Diesel Truck at 15 | | | |
| Noisy Urban Daytime | 200,000 | 80 | Garbage Disposal at 1 m<br>Shouting at 1 m |
| Gas Lawn Mower at 30 m | 63,246 | 70 | Vacuum Cleaner at 3 m<br>Normal Speech at 1 m |
| Commercial Area | | | |
| | 20,000 | 60 | Large Business Office |
| Quiet Urban Daytime | 6,325 | 50 | Dishwasher Next Room |
| Quiet Urban Nighttime | 2,000 | 40 | Small Theatre, Large Conference Room (Background) |
| Quiet Suburban Nighttime | | | Library |
| | 632 | 30 | Bedroom at Night |
| Quiet Rural Nighttime | | | Concert Hall (Background) |
| | 200 | 20 | Broadcast and Recording Studio |
| | 63 | 10 | Threshold of Hearing |
| | 20 | 0 | |

*Source: FHWA*

## Development Tips

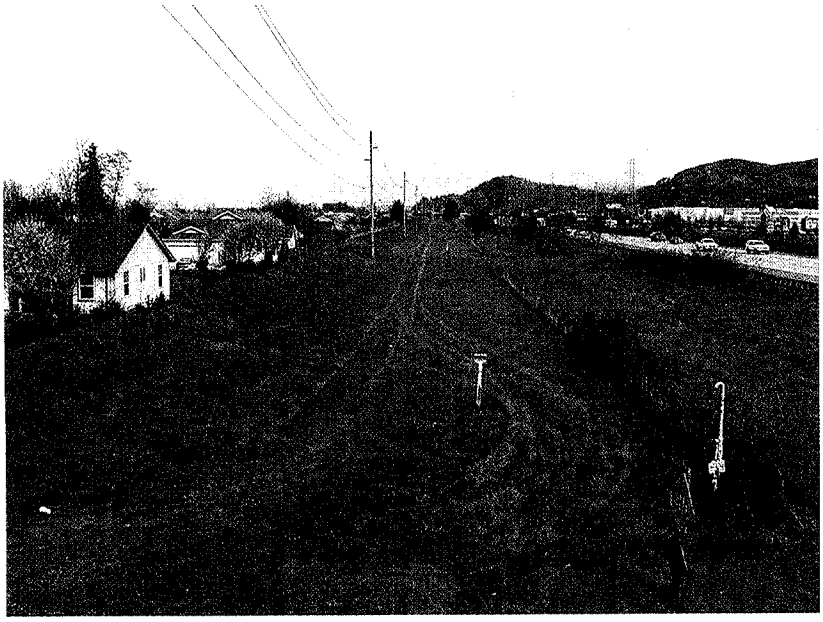
In areas where land is still undeveloped adjacent to highways, communities can guide development toward commercial and industrial purposes, which are not as noise-sensitive as residential uses. Locating commercial development next to highways also affords businesses added visibility and accessibility to existing and future customers.

Another option is to create attractive open spaces next to roads for recreational uses. Undeveloped open space can serve as a buffer zone between the highway and residential areas. The land may be used as a park, and it can give the highway the visual effect of being a greenway. Buffer zones often are ideal locations for utilities and retention basins for site drainage. Planting vegetation in buffer zones provides the additional benefit of psychological relief for residents by blocking their view of the highway.

In denser urban areas, where available land is diminishing and people often prefer to live close to highways for ease of travel, planners can consider other abatement measures. Options include zoning requirements for residential areas that mandate setbacks (added distance) from the highway or ordinances to create exterior or interior noise limits. Communities can use the following approaches to encourage noise-compatible land-use planning:

- Planning, zoning, or other legal means, such as subdivision or development standards, building codes, health codes, or occupancy permits.
- Municipal controls, including land or easement purchases, or the acceptance of land donations.
- Public education to inform citizens, developers, and planners of the options for structures and land uses that can exist in harmony near a roadway.
- Site planning, architectural design, and construction methods that incorporate acoustical considerations.

According to Mark Pfefferle, a planning coordinator for the Maryland-National Capital Park and Planning Commission, increased traffic



This expanse of grass and trees creates a buffer between the highway and the residential community behind it.

*Texas Southern University*

and growth are driving Montgomery County, MD, to update its noise guidelines for subdivisions. "The least desirable areas for residential developments have been passed over," he says, "but now developers are looking to build near major highways to accommodate the rapid growth in the region." Pfefferle says that Montgomery County had noise guidelines in place since 1983, but now the county uses the FHWA Traffic Noise Model® to assess the noise problem.

"Noise is an issue that people should not avoid," he adds. "I lived in a noise-impacted area and hated it. The more information you have, the better you can mitigate noise and improve the living environment for residents."

## Acoustical Solutions

Acoustical planning—designing a site or building a house with noise considerations in mind—also can help address the problem. For example, building homes behind existing hills can help block noise. Privacy walls, intended to reduce residents' views of the highway, can be extended a few feet higher to block much of the noise from entering the first floor of a residence.

The Arizona Department of Transportation (ADOT) considers future expansion of highways when designing and constructing noise barriers.

"When building new walls for projects, we increase the footing size to accommodate a [1.2-meter] 4-foot extension on top of whatever is constructed originally," says Angie Newton, senior transportation planner with ADOT. "If you build a new wall knowing that there may be a need to raise it due to a future widening or capacity increase, you avoid having to tear it down and spend a lot of money just to get a few extra feet."

ADOT is developing a document to provide local governments and developers with a better understanding of the agency's roles and responsibilities in planning, designing, constructing, and maintaining freeway corridors. Including answers to frequently asked questions and recommendations on how to deal with issues ranging from noise mitigation and rights-of-way to utility coordination during construction, the document offers guidance to help municipalities work together to manage growth effectively.

When there is a privacy wall or a noise barrier, placing single-story homes nearest the highway can help protect interior activities, particularly sleep. Since residential developments often include pools, tennis courts, clubhouses, and parking garages in their layouts, placing these activities near the highway can buffer the noise before it reaches residential areas.

Acoustical architectural measures also can reduce the effects of noise from highway traffic. When designing the floor plan for a residence, the architect or builder can place rooms that are less sensitive to noise (e.g., kitchens, bathrooms, and laundry rooms) on the side of the home nearest the highway, opening up space farther from the road for bedrooms and living areas. The architect also can design the house so that it shields the backyard, which has no walls or roof itself to block traffic noise.

Other architectural considerations include: (1) minimizing the number of windows and doors facing the highway; (2) installing double- or triple-paned glass windows and solid-core doors; (3) sealing areas around doors; (4) installing sound-deadening materials such as fiberglass insulation in walls; (5) increasing the building mass; (6) increasing the rigidity of materials used in construction, such as using brick or concrete instead of wood; (7) providing air spaces in

This privacy wall blocks residents' views of the highway and helps reduce traffic noise.

*Texas Southern University*

walls, floors, and ceilings; (8) using rigid metal frame connectors in exterior walls not made of masonry to dampen vibrations from the exterior that may transmit through walls; and (9) installing staggered studs, air conditioning, and noise dampers on air intakes.

## Carrington Development

An excellent example of noise-compatible land-use planning is the Carrington residential development in Fairfax County, VA. A required 60-meter (200-foot) setback normally provides a buffer zone between residences and the Dulles Toll Road to reduce traffic noise, but because the developer offered to use acoustical planning and construction, the county granted permission to build additional homes closer to the highway. To receive the allowance, the developer needed to ensure that the interior noise level for the new homes was lower than 55 dB(A) during the day and 45 dB(A) at night. (It should be noted that acoustical planning and construction provide interior, but not exterior, noise-reduction benefits.)

According to a November 14, 2002, article in *The Washington Post*, "Living in High Style by the Side of a Road," Americans are willing to accept higher noise levels outdoors in return for convenient access to a highway. At the same time, the role of outdoor activities, which are most affected by highway noise, appears to be shrinking along with the size of backyards. Citing a statistic from the National Association of Home Builders, the author of the article explains that the average size of new single-family homes has grown since 1990, but the average size of lots has shrunk by 12 percent. The article concludes that people are not spending as much time outdoors in their yards; instead, they prefer to have larger houses.

## Land-Use Plans

What does it take to incorporate noise compatibility into a land-use plan? The key ingredient is a shared desire to address the noise problem. Residents, planners, developers, and elected officials must work cooperatively to achieve the goal of an improved community for all.

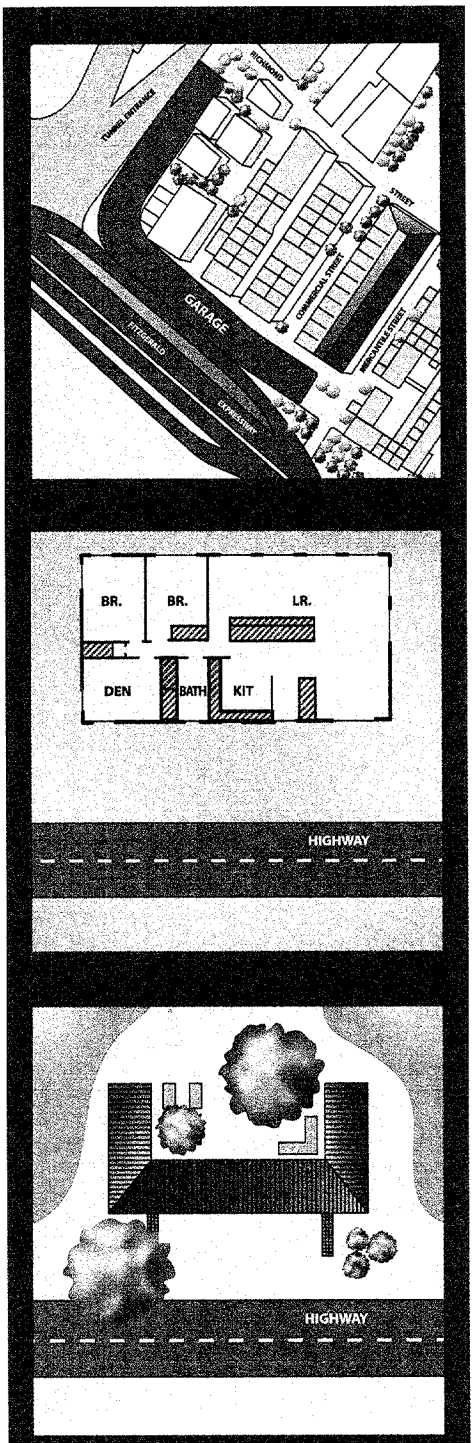
Reducing noise from highway traffic has a price. Developers may bear additional costs for design alternatives that result in fewer homes being built (unless the alternative of denser development is permissible). Builders also may incur costs for using more sound-absorbent materials in construction; however, they often can recover these costs through higher sale prices or rental fees for quieter homes. When developers set a standard for sensitivity and high quality in construction, they contribute to the long-term value of the homes they build.

Local governments may need to fund administrative costs for including standards for noise compatibility into their guidelines and ordinances for land use. But in many cases the benefit of improving the overall quality of life for residents (and possibly avoiding future complaints about highway traffic noise) justifies the expenditures.

## A Sound Future

For successful continued growth in urban and suburban areas, highways and new development must be compatible. By sharing the responsibility for addressing the problem of highway traffic noise, municipalities and developers can plan communities to be more livable and achieve a much less expensive alternative to constructing noise barriers as after-the-fact solutions to mitigate highway traffic noise.

*See "Walls of Fame,"* PUBLIC ROADS, *May/June 2003 for information about context-sensitive and aesthetic noise barriers.*




Source: FHWA

(Top) As shown in this illustration, a parking garage can shield residential areas from a highway.

(Middle) Architects can place less noise-sensitive rooms, such as kitchens and bathrooms, closest to the highway, as illustrated in this floor plan.

(Bottom) This schematic shows that a house can shield its backyard from traffic noise, making outdoor activities more pleasant.

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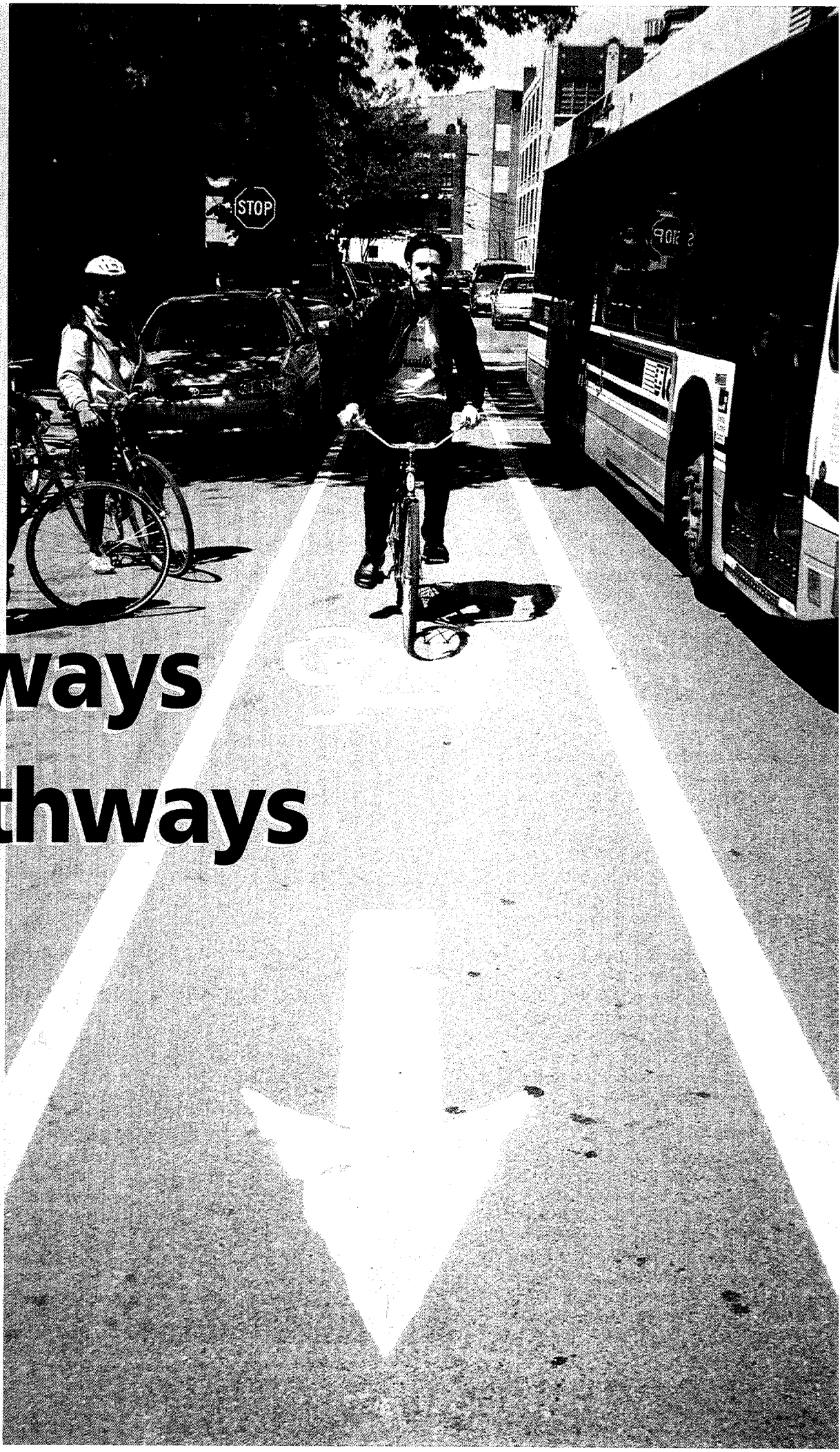
**Chris Corbisier** joined FHWA in August 2001 and is a participant in the Professional Development Program. He is a member of the Highway Traffic Noise Team in the Office of Planning, Environment, and Realty; Office of Natural and Human Environment. He has a B.S. in environmental engineering from the University of Central Florida in Orlando.

*For more information about noise-compatible land-use planning, see the FHWA brochure, "Entering the Quiet Zone: Noise Compatible Land Use Planning," available online at www.fhwa.dot.gov/environment/noise/quietzon/index.htm, or contact Chris Corbisier at 202-366-1473, chris.corbisier@fhwa.dot.gov.*

*Accommodating bicyclists and walkers will promote a healthier transportation system, a healthier environment—and healthier Americans.*

# Bikeways and Pathways

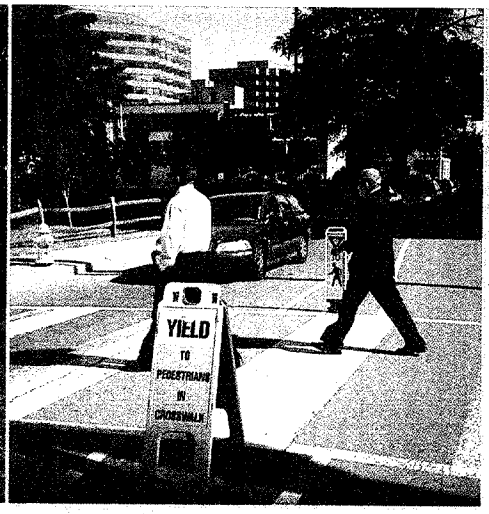
*by*
*Andy Clarke*




**(Right) This bicyclist is traveling on one of the 30–50 kilometers (20–30 miles) of bike lanes that Chicago stripes each year.** *Photo courtesy of Andy Clarke.*

Andy Clarke

Bicyclists on the Mount Vernon Trail cross over an access road to Reagan National Airport in Arlington, VA. The trail was a major evacuation route from the Pentagon, also in Arlington, on September 11, 2001.




Andy Clarke

Pedestrians in Arlington, VA, benefit from signs reminding motorists to yield.

"Today's transportation professionals face a daunting challenge," says Associate Administrator Cindy Burbank, head of Planning, Environment, and Realty at the Federal Highway Administration (FHWA). "We are expected to provide a world-class transportation system that moves freight and passengers efficiently and safely, while protecting the environment, complying with the Americans with Disabilities Act, guarding against earthquakes and terrorism, supporting economic development and livable communities, involving all parts of the community, creating jobs, improving intermodal connections *and* accommodating bicyclists and pedestrians. All with limited resources."

Intuitively, most people recognize that bicycling and walking are good for the environment—energy-efficient, clean, quiet, low-impact—and both require little space. Yet as recently as 1990, former Federal Highway Administrator Tom Larson said, "In this country we have practically written [bicycling and walking] off as a means of transportation." In the same speech to the National Conference on Highways and the Environment, Larson noted the contrast between "what I see here with what I've observed firsthand in European cities, such as Amsterdam, where the idea is to accommodate bicyclists."

## The Numbers Tell the Story

Even today, after unprecedented levels of expenditures on bicycling and walking under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and the Transportation Equity Act for the 21st Century (TEA-21), the percentage of commuter trips made by walking has fallen to less than 3 percent, and bicycling to work remains stubbornly at 0.4 percent of journey-to-work trips. So the tough question that needs to be answered is: Should we continue to accommodate bicycling and walking?

Arguing the question on numbers alone is problematic. To begin with, the usage data are limited, especially at the local levels. The journey-to-work data from the census, for example, ignore partial walking and bicycling trips made to access transit. Even more significant, only one-fifth of all the trips that people make are for commuter trips to work.

Recent Omnibus Surveys by the Bureau of Transportation Statistics reveal that there are a lot of people out walking and bicycling. An average of 33 million adults rode a bicycle an average of 6 days during the 30 days prior to the survey, and approximately 140 million adults made walking trips in the month prior to the survey. Although the data do not fully capture the situation, the one number that everyone can agree on is that crashes involving pedestrians and bicyclists routinely account for some 13 percent of annual traffic fatalities in the United States. In 2001, almost 5,000 pedestrians and more than 700 bicyclists were killed in incidents involving motor vehicles. This figure alone should focus our attention on the vulnerability of nonmotorized travelers in the current transportation system.

## Good Public Policy

Leaving the numbers aside, there are many other compelling reasons why bicycling and walking should be an integral part of the transportation system. An increasing number of agencies and communities are accommodating bicycling and walking as a routine component of their transportation projects and programs.

"Achieving higher levels of bicycle and pedestrian use would have profoundly beneficial effects on a broad spectrum of public policy areas," says Martha Roskowski, executive director of America Bikes. "Congestion and parking problems would be reduced; air quality and energy independence would improve; run-off, noise, community fragmentation, and other motor vehicle-induced environmental impacts would diminish."

Improving public health and overcoming a national epidemic of obesity and lack of physical activity have emerged recently as powerful arguments for encouraging bicycling and walking. Even homeland security would benefit from a more diverse travel mix that would include the capability to evacuate urbanites quickly on foot and by bicycle, as was demonstrated on September 11, 2001.

## Existing Federal And State Policy

Two documents published by the U.S. Department of Transportation (USDOT) make it clear that Federal

## Transportation and Public Health: Working Together to Save Lives

Thanks to the Clean Air Act, and initiatives such as the Congestion Mitigation and Air Quality Improvement Program, half of the U.S. population lives in areas that meet national standards for air quality. Transportation and public health professionals are working together to build on this progress.

The two professions also work closely to reduce the annual death toll of 42,000 and 3 million injuries caused by motor vehicle crashes.

**Bicycling and walking provide active lifestyle opportunities for people of all ages.** *Photo by Dan Burden, Walkable Communities Inc.*

The public health community identified the lack of routine daily physical activity—such as walking and bicycling to work or shopping or to visit friends—as a major reason for the growth of our national girth. Sixty-four percent of adults in the United States are either obese or overweight, a figure that has increased so dramatically in recent years that obesity and diabetes now are considered epidemic. The Centers for Disease Control and Prevention estimates that lack of physical activity causes 300,000 premature deaths each year in the United States.

As a result, transportation professionals increasingly are being asked to incorporate bicycle and pedestrian facilities into the design of our streets and highways to promote a more active lifestyle. The Federal Highway Administration believes that such facilities should be considered an important and integral part of our transportation system.

The Robert Wood Johnson Foundation, a major national health foundation, established an "Active Living" initiative to address this issue. The organization seeks to build physical activity—especially walking and bicycling—back into our daily lives through research, technology transfer, leadership development, and community models. To learn more about the initiative, visit www.rwjf.org.

policy is to promote bicycling and walking as a matter of routine. In 1994, USDOT delivered the *National Bicycling and Walking Study* to Congress containing the ambitious goal of doubling the percentage of trips made by foot and bicycle while simultaneously reducing crashes involving the two modes by 10 percent. These objectives remain a national policy goal today.

In February 2000, again under direction from Congress, FHWA issued a statement of policy on accommodating bicyclists and pedestrians. According to the policy, provision for bicycling and walking should be integrated into all transportation projects unless any of three reasons exist for not accommodating them. The three reasons are excessive cost, clear absence of need, or roads where bicyclists and pedestrians are not permitted to operate.

FHWA based the guidance on existing State laws in Florida and Oregon, two States that are leaders in improving conditions for walking and bicycling. In addition, departments of transportation (DOTs) in California, Kentucky, and Tennessee subsequently adopted the policy guidance.

### Available Funding and Technical Know-how

"Years ago, State and local agencies might have argued that there was no funding available to accommodate bicyclists and pedestrians," says Rob Draper, team leader overseeing FHWA's Byways, Bike-Ped, Trails, and Enhancements programs, "and that the appropriate design solutions and technical knowledge weren't available to do the job. Both of these issues have become moot."

Bicycle and pedestrian projects are eligible activities under all of the major ISTEA and TEA-21 funding programs. In addition to the successful and popular transportation enhancements program, agencies have used Congestion Mitigation and Air Quality funding to install bicycle parking and bike lane networks, National Highway System funds to build trails, Surface Transportation Program monies to improve sidewalks and crosswalks, Hazard Elimination funds to implement Safe Routes to Schools programs, and Scenic Byways funds to improve bicycle travel over long distances.

The technical knowledge and experience with bicycle and pedestrian improvements also have burgeoned in recent years. In 1999, for example, the American Association of State Highway and Transportation Officials (AASHTO) published a new edition of its *Guide for the Development of Bicycle Facilities*, which is twice the size of the preceding edition. The guide is the starting point for most State and local transportation agencies when designing facilities for bicyclists, and it is one of AASHTO's best-selling publications.

A multiyear research program by FHWA and the National Highway Traffic Safety Administration in the 1990s yielded a number of valuable tools:

- The Pedestrian and Bicycle Crash Analysis Tool (PBCAT): a software program to help categorize bicycle and pedestrian crashes and identify potential solutions.
- *The Bicycle Compatibility Index: A Level of Service Concept, Implementation Manual* (FHWA-RD-98-095), an FHWA tool to rate the likely comfort and safety of bicyclists in various roadway situations.
- The Walkability Checklist: a six-page community assessment tool to gauge the walkability of a corridor or neighborhood created by USDOT, the Pedestrian and Bicycle Information Center (PBIC), and the Partnership for a Walkable America. This tool is available at http://www.walkinginfo.org/pdf/walkingchecklist.pdf.
- *Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations: Executive Summary and Recommended Guidelines* (FHWA-RD-01-075) from an FHWA study evaluating crosswalks at uncontrolled

locations and offering guidelines for their use.

In TEA-21, recognizing the need to disseminate the growing body of knowledge in this area, Congress mandated the establishment of the PBIC. Center resources include a series of Web sites, including www.walkinginfo.org and www.bicyclinginfo.org. The sites now are handling more than 40,000 visitors each month.

The PBIC also created a variety of tools:

- *Bike Lane Design Guide*: a design manual for bicycle lanes by a partnership between the Pedestrian and Bicycle Information Center, the City of Chicago, and the Chicagoland Bicycle Federation contains additional information about the merits of bicycle lanes in different situations.
- Bikeability Checklist: a six-page community assessment tool to gauge the bicycle-friendliness of a corridor or community created by PBIC, USDOT, and the National Highway Traffic Safety Administration.
- Exemplary Bicycle and Pedestrian Plans: PBIC's online compilation of more than 25 references to some of the best bicycle and pedestrian planning documents in the United States. Go to this Web site for links to the documents: www.walkinginfo.org/pp/exemplary.htm.
- www.pedbikeimages.org: a digital library of more than 2,500 bicycle and pedestrian images.

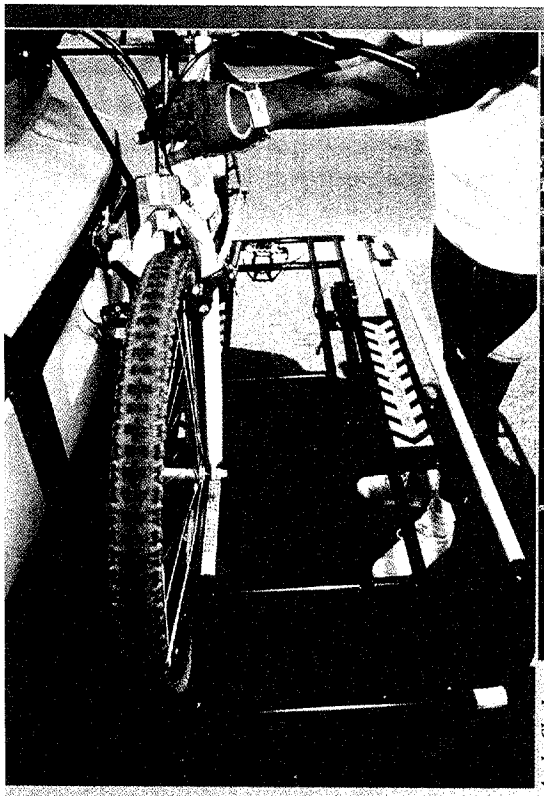
## Design Manuals

Leading local transportation agencies are coming to understand that a successful, well-designed street accommodates multiple objectives and a diversity of users. In November 2002, the City of San Diego published the *City of San Diego Street Design Manual 2002*, which "offers guidelines for the design of streets that will create harmony and promote function for all users while respecting and supporting the needs of the surrounding community." The manual calls for appropriate facilities for bicyclists, pedestrians, and people with disabilities to be included at every intersection as a matter of course. The City of Sacramento is undertaking a similar process. See www.sandiego.gov/planning/pdf/intro.pdf and www.pwsacramento.com/traffic/streetrevisions.html.

The more traditional approach to providing design information for bicycling and walking improvements has been provided in stand-alone design manuals. Florida and Oregon, for example, have extensive and detailed design information available online and in published format. Both States also have invested time and energy in training their State and local design staff to use the manuals.

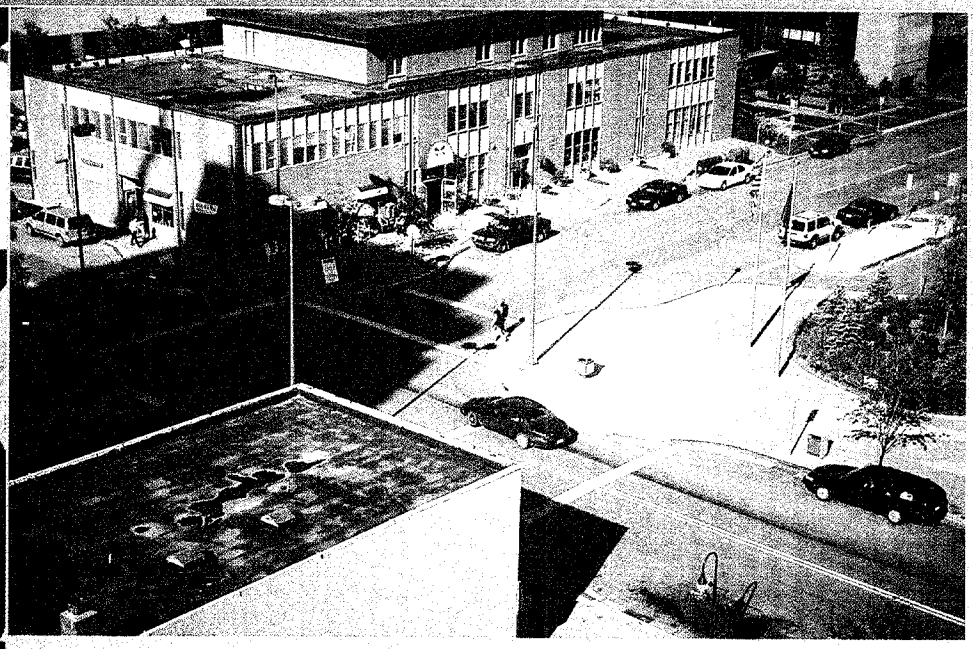
In the early 1980s, the New Jersey DOT adopted *NJDOT Bicycle Compatible Roadways and Bikeways • Planning and Design Guidelines*, a design and planning manual for accommodating bicyclists on the State's roads. A decade later, New Jersey was one of the first States to undertake a comprehensive bicycle and pedestrian planning process under ISTEA, and, as part of that project, developed a companion publication, *NJDOT Pedestrian Compatible Planning and Design Guidelines.*

Bill Feldman, the State's bicycle and pedestrian coordinator during this period, says, "Even then, we realized our engineers were designing roads for motor vehicles first and then looking at the bicycle and pedestrian manual to see what else



Andy Clarke

**(Left) Today, bike racks such as this one can be found on almost half of the Nation's transit bus fleet.**



Andy Clarke

**(Above) On this Anchorage street corner, the bulb-outs shorten crossing distances, prevent cars parking close to the intersection, and provide more space for wheelchair ramps.**

might still fit. We wanted them to start with designs that worked for everyone."

Today, the New Jersey DOT is adding three new chapters to the State's *NJDOT Design Manual - Roadway* that cover traffic-calming, bicycle, and pedestrian designs.

## Everyone Benefits

"We do very little *just* for bicyclists," says Michael Ronkin, Oregon DOT's bicycle and pedestrian coordinator. "Certainly, we pave wide shoulders on our State roads, and that gives bicyclists a great place to ride. But it also provides for snow storage, vehicle recovery, better clear zones, and better sight lines, and it adds years to the life of the roadway. In fact, we've compiled a list of capacity, safety, and maintenance reasons for adding shoulders and posted them on our Web site. Similarly, bike lanes on urban roads give tremendous benefits to pedestrians and motorists as well as cyclists." See www.odot.state.or.us/techserv/bikewalk/whyhave.htm.

The City of Seattle has turned more than a dozen four-lane arterials into streets with just two travel lanes, a center turn lane (or a median and left-turn pockets), and bike lanes or wider curb lanes. "The streets work better for everyone," says Peter Lagerwey, the city's bicycle and pedestrian program manager. "Drivers like them because they can make left turns more easily and traffic runs more smoothly; bicyclists like them because they get space to ride; pedestrians like them because cars are generally traveling more slowly, they are buffered from traffic by the bike lane, and they can cross the street much more easily with pedestrian crossing islands. Capacity isn't affected on streets with a lot of left-turning traffic or frequent signals, and even local businesses approve because it is easier for left-turning vehicles to access their parking lots."

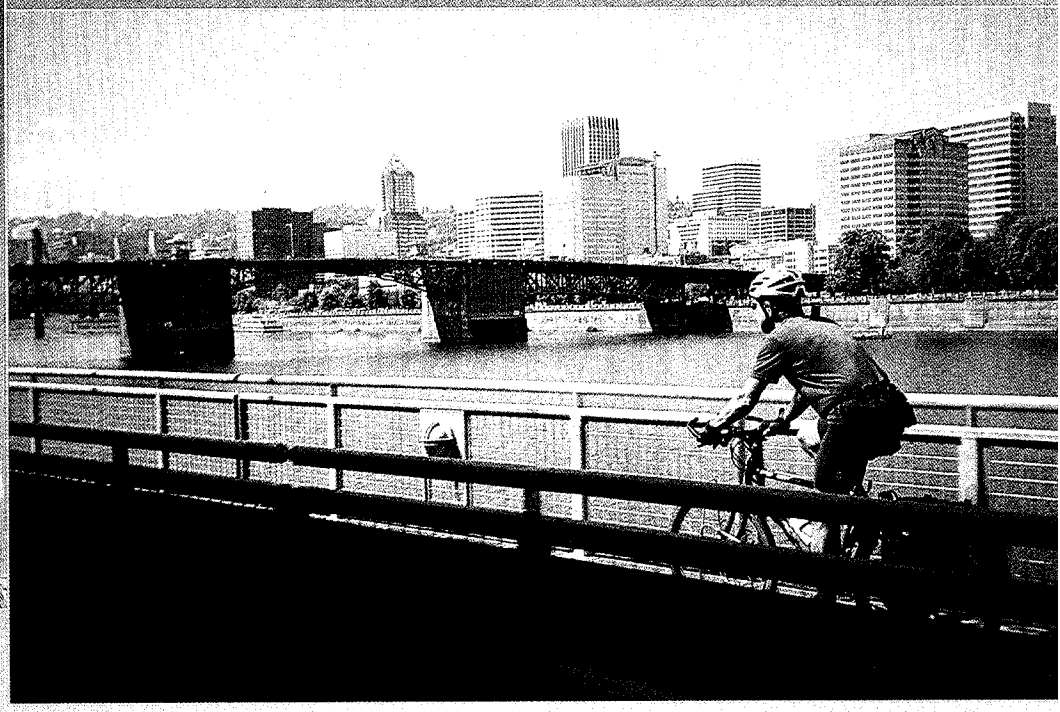
A study of these "road diets"—the change of a roadway from four lanes to three—shows that four-lane streets with up to 20,000 vehicles per day are candidates for this kind of treatment. (See www.walkable.org/download/rdiets.pdf.) "Providing better conditions for bicycling and walking is also critical to running a successful transit system," says Pennsylvania DOT Assistant Deputy Secretary Chris Johnston. "People have got to be able to walk quickly, safely, and comfortably to and from transit. They must be able to cross the street to get to the bus stop without having to walk half a mile along a street with no sidewalk to get to the nearest pedestrian signal."

Johnston continues: "The beauty of bicycling is that it extends the potential catchment area for transit service 12-fold. People are only willing to walk a few hundred yards to get to transit, but in the same time they can cover a couple of miles on a bike. It makes sense to enable and encourage people to do that."

Integrating bicycles and transit also involves providing adequate secure bicycle parking at subway stations, and adapting transit vehicles to carry bikes. Almost half the Nation's transit bus fleet now is equipped with bike racks to carry up to two bikes, and ridership is soaring. The Metro Transit bus system in the Seattle area was one of the "early adopters" and now has more than 60,000 bike-bus boardings each month. Officials in Broward County, FL, attribute a


Photos: Andy Clarke

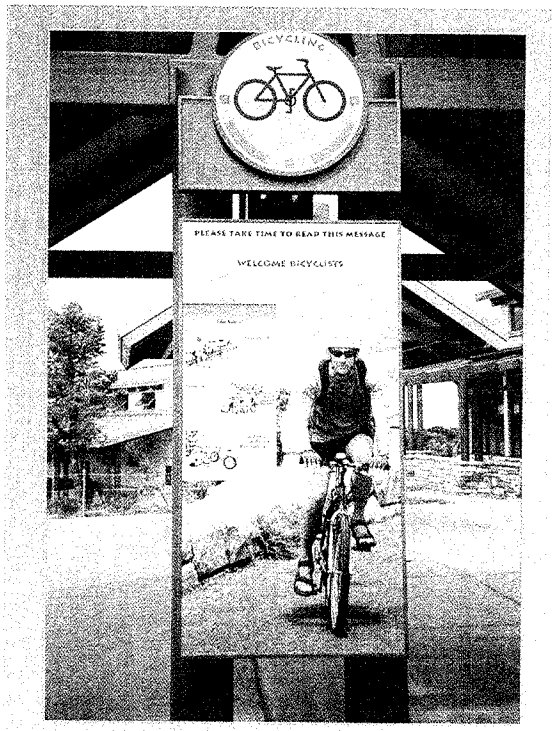
This sign in Portland, OR, shows the use of bike lanes at intersections with heavy right-turning traffic.



This cyclist on the Eastbank Esplanade in Portland, OR, depends on bridge access, critical for the mobility of bicyclists and pedestrians.

halving of bicycle fatalities in their county to the availability of bike racks on buses. The county is getting 30,000 bus riders per month with bikes.

In 1999, the Denver Regional Transit District studied the impact of its bike-and-ride program and found that there were 2,300 bike-on-bus trips on an average summer weekday (1.4 percent of all passengers) and that approximately half were new transit users. According to a transit district survey in December 1999, one-quarter of the riders said they would drive alone if the option to put their bike on the bus were unavailable.




**This sign at an information plaza welcomes bicyclists at Grand Canyon National Park.**

The Caltrain commuter rail network between San José and San Francisco is a model for bike and rail integration. Almost 2,000 bicyclists per day take their bikes on board specially designed cars capable of carrying up to 32 bikes and their riders. Most of the trains have two "bike cars."

## Will Accommodating Bicycling and Walking Make Any Difference?

As mentioned earlier, bicycle use and walking remain at relatively low levels in the United States. Bicycle commuting rates are three times higher in Canada than they are here, and even the Canadian figure of 1.2 percent is small compared to Germany (11 percent), Switzerland (15 percent), Denmark (18 percent), and The Netherlands (27 percent).

In the United States, however, bicycling plays a significant role in some communities. In Davis, CA, 22 percent of journeys to work are by bicycle—a figure surpassed only by the California campus communities of Stanford and Isla Vista (Santa Barbara) at 48 percent and 27 percent respectively.

In numerous other cities, such as Boulder, CO; Eugene and Corvallis, OR; Chico, Berkeley, Palo Alto, and Santa Cruz, CA; and Gainesville, FL, between 5 and 10 percent of trips to work are by bike. And in larger cities like Sacramento, CA; Minneapolis, MN; Tucson, AZ; Tempe, AZ; and Madison, WI, more than 2 percent of trips take place by bike.

The potential to increase bicycle use remains high. A significant percentage of all trips are still less than 3.2 kilometers (2 miles) in length (the average trip distance by bike) and almost half are less than 8 kilometers (5 miles) long. The question remains whether that potential can be tapped.

Individual projects show a significant impact. The Denver bike-n-ride program is one example. And the Seattle downtown bike lane-striping program helped increase the number of bicyclists entering the downtown by 57 percent between 1992 and 2000. Even more impressive, perhaps, is the progress that has been made in Portland, OR.

## Portland: Pulling It All Together

In November 2001, the consumer magazine *Bicycling* named Portland, OR, as the "best overall city for bicycling" in the United States. Long renowned for its commitment to smart growth and walkability, the city also can serve as a good example of what can be achieved for bicycling.

In 1996, the city adopted a new bicycle master plan. At the time, the bicycle network stood at 179 kilometers (111 miles), and the target was close to 966 kilometers (600 miles). After 5 years, the network had grown to 367 kilometers (228 miles) and was almost 40 percent complete.

The city offers more than 2,100 bicycle parking spaces and 350 secure lockers. More than $12 million has been spent upgrading bicycle access to the bridges spanning the Willamette River—a critical part of the network—and daily bicycle trips across the bridges have more than doubled since 1995.

Since 1991, bicycle trips have increased by 143 percent without any rise in the number of bicycle-motor vehicle crashes.

## Where Do We Go from Here?

Increasing the number of people bicycling and walking as part of their daily lives in the United States offers numerous benefits. The funding and technical knowledge are available to encourage more people to walk and bicycle. Policies and programs are in place to facilitate those efforts, and a number of communities are starting to achieve real change.

FHWA Associate Administrator Burbank concludes, "The future for bicycling and walking is bright—but we must remain vigilant to ensure we don't allow ourselves to write off the two modes, as so nearly happened in the 1980s.

"Equally, we must be ready to take advantage of every opportunity to improve conditions for bicycling and walking, not because we have to, but because increased bicycling and walking will lead to a healthier, more balanced transportation system—as well as healthier individuals and healthier communities."

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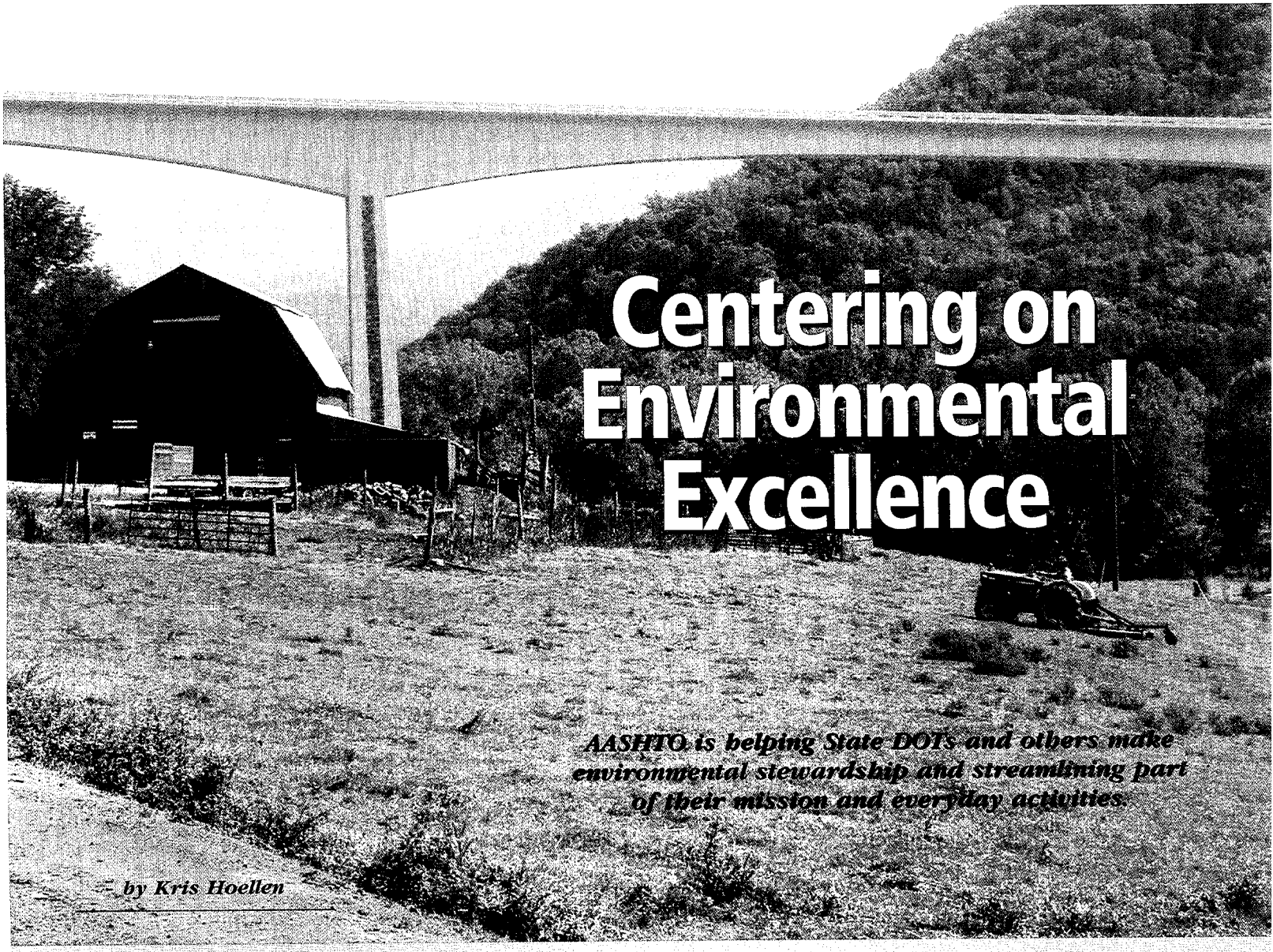
**Andy Clarke** recently joined the staff of the League of American Bicyclists as the director of State and Local Policy. Prior to that, he was the executive director of the Association of Pedestrian and Bicycle Professionals and worked onsite at FHWA as part of a grant to run the Pedestrian and Bicycle Information Center. Clarke has 20 years of experience in bicycle and pedestrian transportation issues in both the United States and Europe and is a daily bicycle commuter in Washington, DC.



# Centering on Environmental Excellence

***AASHTO is helping State DOTs and others make environmental stewardship and streamlining part of their mission and everyday activities.***

*by Kris Hoellen*

"Our customers demand that our projects and activities fit, look good, have balance, and are sensitive to the human and natural environment," says Secretary James C. Codell III of the Kentucky Transportation Cabinet. "Therefore, we must continue to change our culture to one that has an environmental ethic and assumes an environmental stewardship role. It is the correct approach . . . the right thing to do. . . the common sense thing to do, and our customers deserve this type of treatment."

With these words, Codell announced the adoption of a new environmental policy for his transportation agency. The Kentucky Transportation Cabinet is not alone in recognizing that its customers, the traveling public, increasingly are demanding and expecting transportation projects that not only improve mobility, but also protect and preserve the environment and help create healthy and vibrant communities.

To assist State departments of transportation (DOTs) with meeting these goals, the American Association of State Highway and Transportation Officials (AASHTO), with the assistance of the Federal Highway Administration (FHWA), launched the AASHTO Center for Environmental Excellence in 2002. The center design will serve as a one-stop resource for transportation professionals seeking technical assistance, training, information exchange, partnership-building opportunities, and quick and easy access to environmental tools.

The center will encourage environmental stewardship by State DOTs and promote innovative ways to streamline the delivery of projects in a manner that can be replicated easily throughout the country. To accomplish this, the center has five primary goals:

- Increase the capacity of State transportation agencies to deliver environmentally sound transportation projects and programs.
- Promote environmental leadership and stewardship in transportation.
- Effectively and efficiently mainstream environmental considerations into transportation planning, design, construction, maintenance, and operations.
- Build productive partnerships and working relationships among

**(Above) At 53.5 meters (175 feet) above Wilson Creek near Blacksburg, VA, the Smart Road Bridge is Virginia's tallest bridge. Shown here soaring above a farm and against a backdrop of mountains, the bridge incorporates visual characteristics suggested by a citizens' advisory committee from the New River and Roanoke valleys.** *Photo courtesy of AASHTO.*

AASHTO members and their transportation partners.
- Serve as a resource for expert transportation and environmental knowledge and information exchange among transportation and environmental agencies and interest groups.

## Stewardship and Streamlining Defined

Although the transportation industry has no single definition of environmental stewardship, individuals and agencies involved in transportation are developing their own working definitions based on their experiences, interests, and unique needs. AASHTO believes that stewardship is not about enacting new laws or regulations, but about State DOTs making a renewed commitment to include environmental protection and enhancement as an integral part of their missions.

This commitment includes but is not limited to making decisions based on an understanding of the consequences of those choices on the natural, human-made, and social environments. It also means instilling and promoting environmental protection and enhancement in organizational and individual attitudes, ethics, and behaviors; supporting environmental conditions, aesthetics, and quality of life when possible; and integrating environmental protection as a core business value.

Generally, environmental streamlining is defined as a process in which transportation and environmental agencies work together to establish realistic schedules for project development and to ensure that the agencies adhere to those timetables, while fully complying with environmental responsibilities. Environmental stewardship and streamlining work in tandem because State DOTs understand that promoting environmentally sound practices should lead to faster approvals of projects, resulting in improved quality of project deliveries and the environment.

## The Center's Services

Based on an assessment of the needs of State DOTs, the center is designed to provide three basic services for transportation professionals: information sharing; training, problem solving, and partnership building; and technical assistance. Although the center tailors much of the work to State DOTs, all stakeholders associated with the delivery of transportation projects, including Federal and State agencies, other transportation organizations, the environmental community, and the public, should benefit from the center's resources. Many of these resources will be available publicly on the Internet.

AASHTO expects that the center will support the FHWA strategic goal of protecting and enhancing the natural environment and communities affected by highway transportation.

## Information Sharing

The philosophy of the center, and AASHTO in general, is that States tend to learn best from other States' previous experiences. Therefore, a primary function of the center is to serve as a one-stop resource for State DOTs that want to access the latest transportation tools, along with information on the best practices for environmental streamlining and stewardship used by other State DOTs.

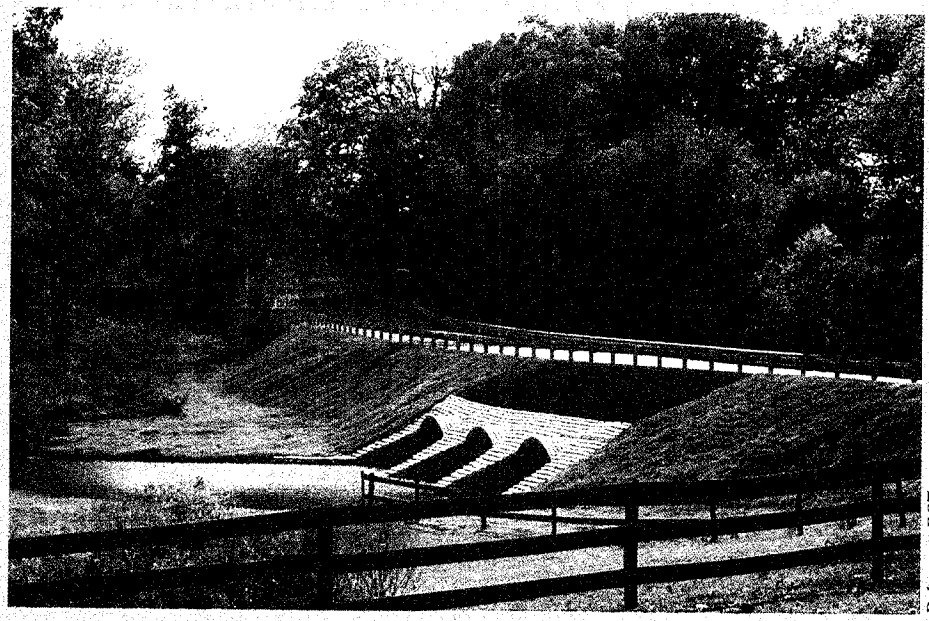
The focal point of the center's information-sharing activities will be an Internet-based clearinghouse and referral center accessible through AASHTO's Web site at www.aashto.org. AASHTO will tailor the site to meet the needs of State transportation agencies. The site will contain information on programmatic approaches to environmental stewardship and streamlining, publications on environmental best practices, and other materials, including contact information for various streamlining and stewardship projects and resources.

In addition, the Web site will serve as a referral center by listing important Internet links to other sites that could benefit State DOTs. The goal of the Web site is to save transportation professionals' time and resources.

## Other Information Initiatives

In addition to the information-sharing Web site, the center undertook three other initiatives related to information exchange. The first was to launch a competition on stewardship best practices to recognize State DOTs that use innovative ways to add environmental stewardship on a case-by-case basis, on a programmatic level, or through institutional or organizational changes. AASHTO will announce the award winners during its annual meeting, scheduled for September 5–9, 2003. AASHTO also will produce a report highlighting the best practices of each award winner.

Second, the center plans to implement and expand the AASHTO Stewardship Demonstration Program.



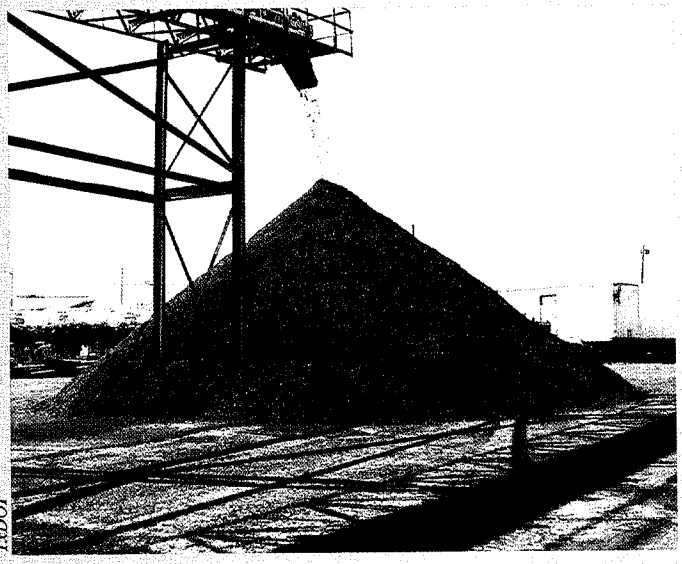
Delaware DOT

**Safety, environmental, and aesthetic considerations were key aspects of this project on State Route 430 in Delaware, which involved replacing a deteriorated timber structure with three multiplate pipes to accommodate stream flow beneath the roadway.**

Started by AASHTO in October 2001, this voluntary program invites State DOTs to register examples of stewardship on the program's Web site (www.stewardship.transportation.org).

In 2002, the center took responsibility for this program and plans to expand it from simply tracking projects to showcasing and sharing project information with member States and other interested individuals and organizations. Visitors to the site will be able to read project descriptions, download evaluations and reports on results, and follow progress as the center updates the information on individual projects.

In conjunction with the Stewardship Demonstration Program, the center will hold Internet-based teleconferences on various topics related to environmental stewardship. For example, at a center teleconference in April 2003, professionals from State DOTs heard leading-edge practitioners from across the country discuss not only why they incorporated stewardship into their missions, but also *how* they incorporated those changes into their missions and daily operating procedures.



TxDOT

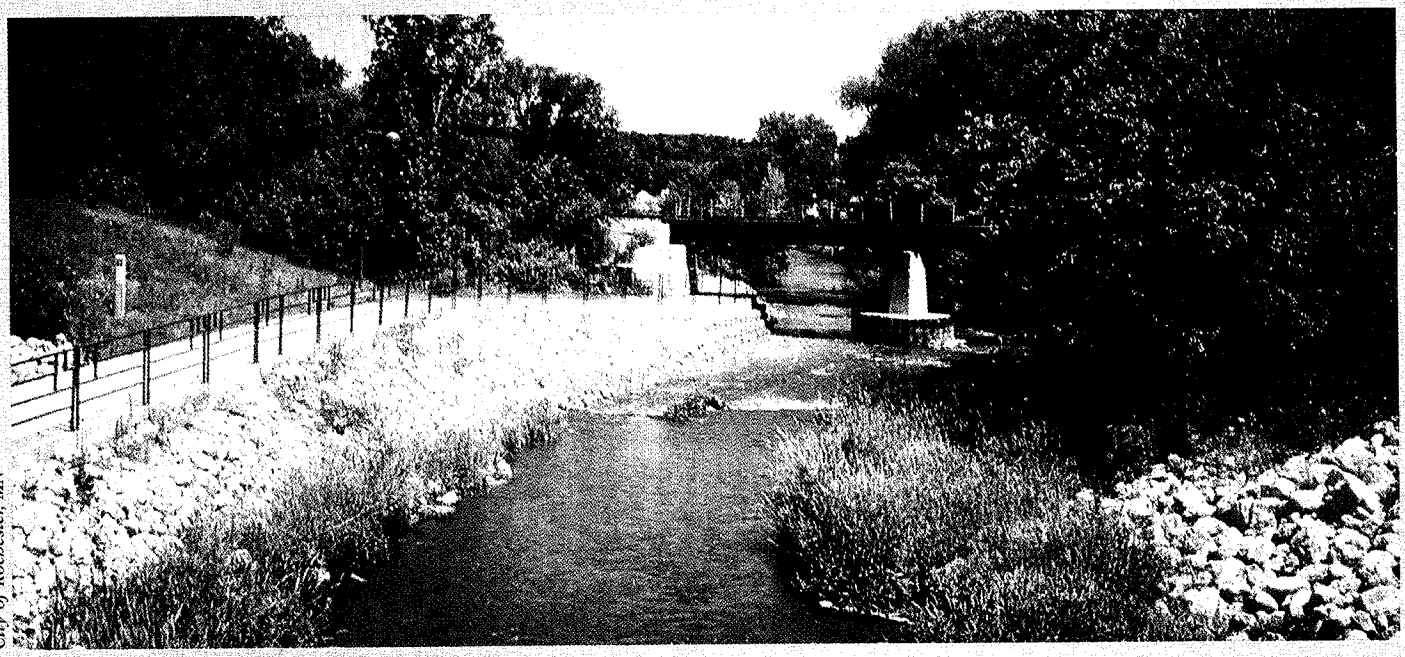
**In 2002, TxDOT paid $500,000 to process nearly one million tires' worth of rubber into fuel, crumb rubber, or other rubber products and used more than one and a half million tires' worth of crumb rubber in various paving designs and road maintenance.**

Finally, the center is producing a report outlining the positive environmental and societal benefits achieved through transportation projects. The report will serve as an educational tool for the public. The impetus is to communicate the positive impacts associated with transportation projects. Adverse effects are well documented and fairly well understood, but the same cannot be said for the many environmental and societal benefits gained from repairing and constructing highway projects.

Few people realize, for example, that the transportation industry is the largest recycler in the United States through pavement remilling, fly ash usage in concrete, and crumb rubber (from used tires) utilization in pavement design and road maintenance. Nor is it commonly understood that the greatest chance for achieving a net gain in wetlands is in connection with highway projects. AASHTO believes that transportation agencies should document and share with the public all of the environmental impacts (both positive and negative) connected with the transportation industry.

## Training, Problem Solving, Partnership Building

The second major component of the center's activities focuses on training, problem solving, and partnership building. During 2003 and 2004, the center will launch a three-part training initiative to introduce State DOTs to the concept of environmental management systems (EMS) and promote the use of these systems as a tool for enhancing environmental stewardship.



City of Rochester, MN

**This pedestrian and bicycle trail along Cascade Creek in Rochester, MN, connects four previously built trail segments, linking several city park facilities and providing a scenic, off-road link to downtown businesses.**

First, on August 10–13, 2003, the center will sponsor an EMS workshop for State DOTs. Sessions will focus on the theory behind the EMS, the expected benefits from their implementation, methods for quantifying and documenting the expected benefits, potential organizational and institutional hurdles associated with EMS implementation, and lessons learned from States that have already started the EMS process. The center encourages representatives from the environmental and maintenance divisions of State DOTs to attend the workshop.

Washington State DOT

**This oversized culvert installed over Ludvick Lake Creek on a rural road in Mason County, WA, features log weirs upstream and downstream that improve fish passage for adult coho salmon.**

In the second training initiative, the center is developing draft EMS templates tailored toward the various functions performed by State DOTs to help interested States develop their own systems. AASHTO hopes to encourage State DOTs to pilot the templates, alter them as appropriate, and provide feedback to AASHTO on their utility.

Finally, the center is recruiting EMS professionals to join its team of technical experts to assist States that either decide to pilot a template or develop their own EMS.

In addition to the EMS initiative, the center is creating a CD-ROM on how to negotiate and structure programmatic agreements. This how-to tool will feature samples of language contained in actual cultural and natural resource agreements, along with recommendations on when, why, and how to develop a programmatic agreement. Lessons learned from States that have these agreements will be included on the CD, which will be distributed to all 50 States.

While these activities primarily are targeted at training for State DOTs, the center also will focus on problem-solving and partnership-building exercises for the agencies and organizations that work with State DOTs on transportation issues. Topics to be covered in these activities include air quality, the creation of biological databases, and historic preservation.

## Technical Assistance

The center's third service—technical assistance—is designed to help State DOTs with immediate project issues and long-term program needs involving the institutionalization of environmental stewardship practices and environmental streamlining approaches. The center is developing a national, prescreened team of on-call experts who will be available to serve the environmental needs of transportation agencies and the transportation needs of environmental agencies.

Drawn from Federal, State, and local government agencies, consulting firms, academia, and including qualified environmental specialists retired from transportation and environmental agencies, the team will be available on short notice to address a State DOT's needs. The multidisciplinary teams will provide technical assistance that otherwise would not be available expeditiously through normal contracting procedures.

The expert teams also will provide State DOTs with information and guidance on strategic planning for the many challenging issues and topics facing transportation and environmental regulatory agencies, such as endangered species, land use planning, wetlands and water quality, and management of cultural resources.

To date, the center has provided experts to help State DOTs with a number of projects. They are helping develop databases on historic bridges, providing workshops on partnership building, and assessing the overall stewardship ethic of States requesting that assistance.

According to John Horsley, executive director of AASHTO, "The center is a continuation of AASHTO's efforts to find new ways to assist State transportation agencies in improving public trust, credibility, environmental performance, and ultimately program delivery."

AASHTO and State DOTs recognize that opportunities exist for making environmental stewardship part of every step in the delivery of transportation projects, from planning and design to construction, operations, and maintenance. The AASHTO Center for Environmental Excellence will assist States with this incorporation of environmental stewardship into their everyday activities.

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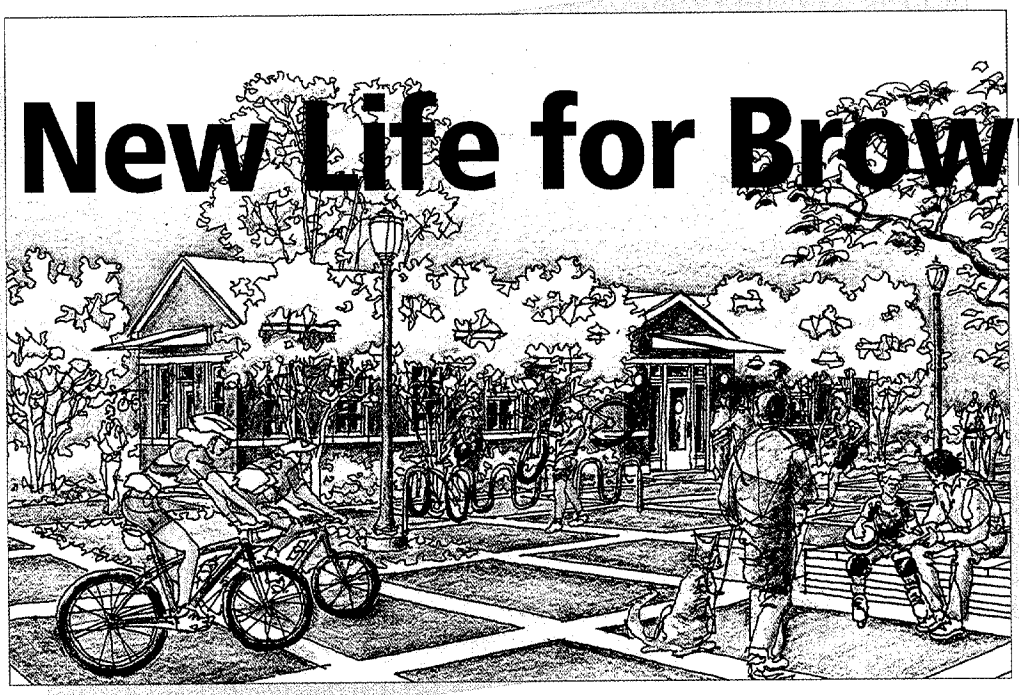
**Kris Hoellen** is AASHTO's director of environmental programs. Prior to joining AASHTO, Hoellen served as a senior program officer for the Transportation Research Board (TRB), where she was appointed the study director for two National Research Council studies. The first study focused on the development of a national agenda of energy, environment, and planning research for surface transportation; the second explored the scientific and regulatory bases for establishing environmental windows for dredging projects for the U.S. Army Corps of Engineers. Prior to joining TRB in 1999, she served for 9 years as the legislative director for the Association of State and Territorial Solid Waste Management Officials, a trade association representing the waste divisions of the State Environmental Protection Associations. Hoellen began her career working in the television industry as an associate director of marketing. She received a bachelor's degree from Emory University and a master's degree from Johns Hopkins University.

*For more information, contact Kris Hoellen at 202-624-3649.*

# New Life for Brownfields



*by Constance M. Hill*

***Across the country, transportation projects play a critical role in revitalizing abandoned industrial properties.***

What does a relocated roadway in Oregon have in common with a riverfront path in Kansas City and freight movement in New Jersey? All three represented opportunities for transportation projects to help with the redevelopment of formerly contaminated industrial properties known as "brownfields." In each case, transportation played a major role in the successful use of these sites to promote economic development and community revitalization.

According to U.S. Department of Transportation (USDOT) Assistant Secretary for Transportation Policy Emil Frankel, "Transportation can foster the redevelopment of brownfields through ensuring access to redeveloped sites, considering transportation-related uses among the redevelopment possibilities, and fostering partnerships between Federal, State, and local transportation, economic development, and environmental interests. Redevelopment of brownfields can allow the use of existing infrastructure and services, thereby reducing the cost of new public investment."

A national effort is underway to encourage greater use of brownfields to meet many of the economic, environmental, and social challenges faced by cities and rural communities alike. The Bush Administration and the U.S. Environmental Protection Agency (EPA) have identified the cleanup and redevelopment of contaminated industrial sites as one of their environmental priorities. The results of recent research funded by the Federal Highway Administration (FHWA) reveal that transportation plays a critical role in promoting the cleanup, reuse, and redevelopment of brownfields.

**(Above) The proposed northern terminus of the Town of Kansas Pedestrian Bridge, shown in this illustration, features pedestrian and bicycle facilities, as well as parking.** *Illustration by BNIM Architects.*

## Brownfields Defined

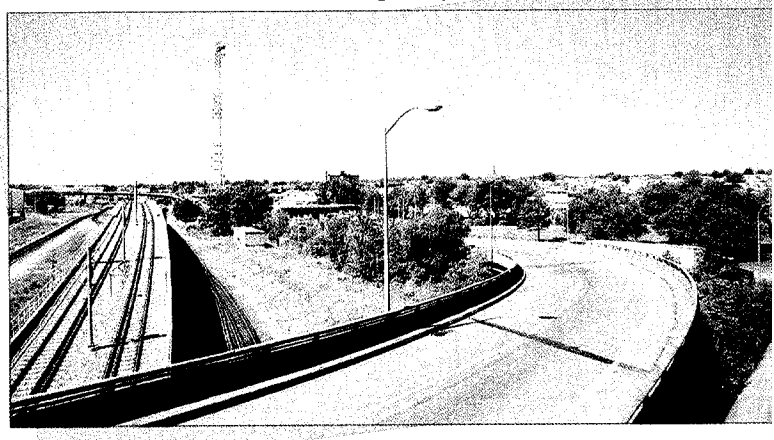
The Small Business Liability Relief and Brownfields Revitalization Act, signed into law on January 11, 2002, defines these sites as "real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant." The 2002 legislation provides EPA with funding for brownfield programs and initiatives.

EPA estimates that more than 500,000 of these sites exist nationwide, in large and small cities, rural communities, and on tribal lands. Brownfields range from sites already cleaned up to others that are contaminated lightly with pollutants that could be cleaned with reasonable effort and cost. Brownfields are not Superfund sites, which are usually much more heavily contaminated and require more effort and resources to clean up.

## Linking Transportation And Brownfields

Recognizing cleanup of these sites as a national priority, USDOT and FHWA support the EPA-led National Brownfields Redevelopment Initiative in a number of ways. In November 2002, USDOT articulated its commitment to revitalization of industrial sites through the Brownfields Federal

**A brownfield property in Newark, NJ, offers proximity to this rail line and interstate highway.**



**Trucks travel down North Marine Drive in Portland, OR, passing new commercial developments made possible by a new roadway alignment through brownfields.**

Partnership Action Agenda, joining 21 other Federal agencies to formulate an agenda for delivering technical, financial, and other resources to communities to assess, clean up, and redevelop these sites.

Since 1998, FHWA has operated under a policy that permits the use of Federal-aid highway funds to support the transportation components of projects to redevelop brownfields, when appropriate. For example, Federal-aid funds may be used for site assessment and cleanup, or for providing better access to or from a site.

More recently, FHWA funded research to increase understanding of where and how transportation has functioned as a mechanism for redevelopment of brownfields. The results of this first-ever study indicate that transportation facilities have had a significant impact on redevelopment of these sites in a number of communities across the country. The research also shows that opportunities exist for transportation to play an even greater role in the increased use of brownfields for the revitalization of inner-city neighborhoods, protection and creation of green space, control of urban sprawl, and elevation of property values and community tax bases.

## FHWA Funds Research

Under the 2001 Minority Institutions of Higher Education Competitive Assistance Program, FHWA funded the research conducted by Clark-Atlanta University and the Georgia Institute of Technology. The study's purpose was to analyze brownfield redevelopments around the country where transportation played a major role in the success of the development or in plans for its future. The study describes these projects as brownfield-transportation redevelopments.

The goals of the research were to characterize the nature and role of transportation in brownfield redevelopments and identify opportunities for more successful integration of redevelopment and transportation improvements. The study also sought to clarify how USDOT and FHWA fostered such developments and how Federal transportation agencies can improve the process. An important research contribution was to identify the factors that promote and impede successful brownfield-transportation developments.

The study showed that a variety of transportation facilities were developed in association with brownfields, including new highway construction, roadway improvements and upgrades, bicycle and pedestrian pathways, and transit stations. Through 10 case studies, the FHWA study shows that States across the country are demonstrating the value of partnerships and financial leveraging to help accomplish community goals.

## Examples from The Field

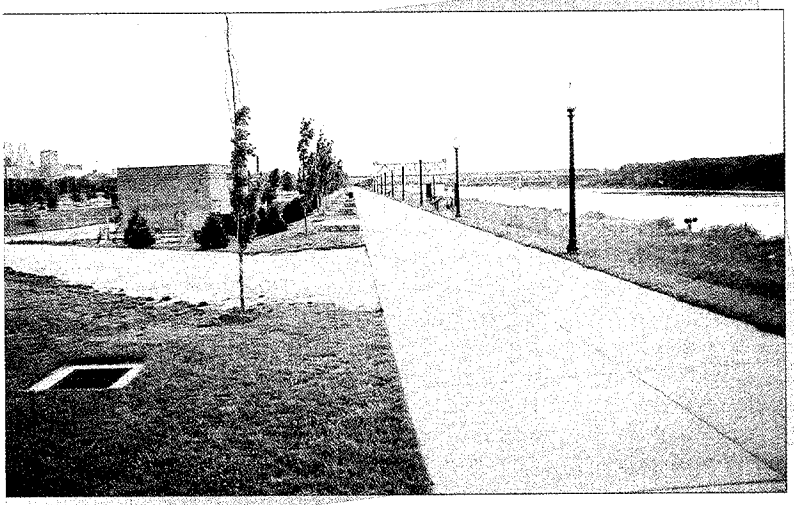
Planned and ongoing projects in Kansas, Missouri, New Jersey, and Oregon offer illustrative examples of how States are using Federal-aid highway funds to redevelop brownfields while making improvements in the transportation system. The projects also demonstrate the commitment of communities to protecting the environment, while improving quality of life through economic enhancement and job creation.

The City of Portland is Oregon's oldest and largest industrial, commercial, and shipping center. Thanks in part to a project to relocate and improve North Marine Drive, Portland recently benefited from increased use of the city's only deepwater port and renewed development along the urban riverfront.

The Federal-aid Highway Program provided $14.6 million, or 58 percent, of the $25 million cost for completing the North Marine Drive Project, which involved the relocation of a road through contaminated land to provide access from Interstate 5 to the deepwater terminal. In addition to promoting land recycling and revitalization of the 1,133-hectare (2,800-acre) Rivergate Industrial District, the relocation of the roadway also protected nearby wetlands from encroachment.

According to Jeffrey Graham, operations engineer with the FHWA Oregon Division, the North Marine Drive Project was a capacity improvement that provides better access to the port. "In the past, it took trucks longer to get in and out," he says. "The new road, with additional wider lanes, improves the efficient operation of the port and helped the property become more desirable for development. The project also improved access to Kelly Point Park, at

**The North Marine Drive project not only spurred new commercial development on brownfield properties in the Portland area, but also improved access to the Smith and Bybee Lakes Wildlife Area.**



**This segment of the Riverfront Heritage Trail, shown here at Berkeley Park, offers a sweeping view of the Missouri River (right) and downtown Kansas City, MO (left). The trail helps link the city back to its history of relying on the river for transportation and commerce.**

the confluence of the Willamette and Columbia Rivers, and Smith and Bybee Lakes, which offer recreational opportunities for the public."

As required with all transportation projects using Federal-aid highway funds, the local metropolitan planning organization (MPO) included the North Marine Drive Project in the region's Transportation Improvement Program. The project also was eligible for funding from both transportation and brownfield redevelopment-related sources. This project demonstrates how municipalities can locate transportation projects strategically to maximize available funding sources.

## Riverfront in Kansas City

In Kansas City, there are plans to complete a bicycle and pedestrian trail along the Missouri River that will link the downtown business districts of Kansas City, KS, and Kansas City, MO, providing residents and visitors with access to cultural, commercial, and retail centers.

On what had been nine idle brownfield properties, the 15-kilometer (9-mile) Riverfront Heritage Trail will revitalize the urban riverfront, providing much-needed improvements that will expand transportation options for the citizens of both cities. At the same time, the trail will endeavor to meet various social, recreational, and economic development goals. The project also will be used as an educational resource, since it will provide access to a restored natural area where visitors and citizens can learn about wetlands and river ecology.

"The Riverfront Heritage Trail is a prime example of a project that has required extensive coordination, collaboration, and cooperation among a number of different authorities in Missouri and Kansas," says Dr. H. Darby Trotter, vice president of Faultless Starch Bon Ami Company, which is planning to build a major production facility on one of the brownfield sites. "Using the resources of the Missouri and the Kansas Rivers, it is a bi-State, bi-river project that acts as a lace tying the people of both States together in a common effort to reawaken the community to its unique historical roots, some of which will be demonstrated in artistic expressions. It is a critical amenity in the reconstruction of the urban core."

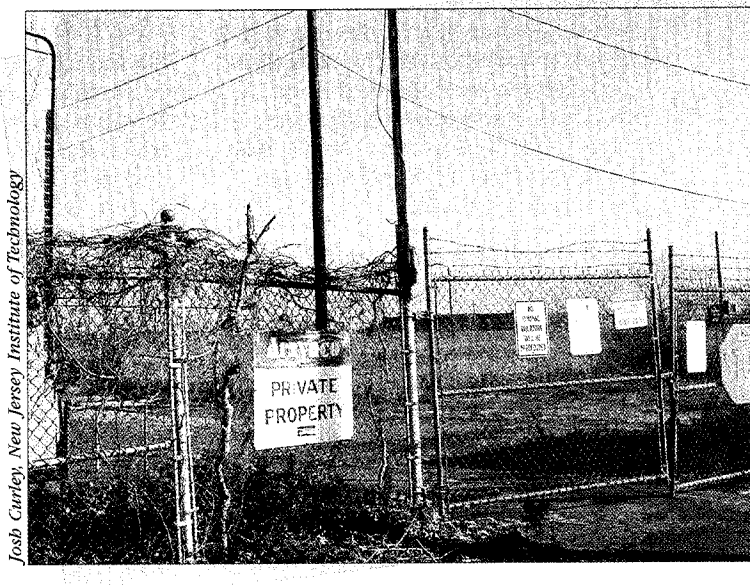
Funds from two FHWA programs will help finance design and construction of the trail. Transportation Enhancement (TE) funds provide approximately $6.1 million, and the Congestion Mitigation and Air Quality (CMAQ) Improvement Program adds about another $2 million to construct portions of the connector trail.

"The Riverfront Heritage Trail project has been very well received in the community," says Joe Remmers, project manager for Kansas City, MO, Public Works Engineering. "Some parts of the trail are completed, some are currently under construction, and more construction is planned for late fall 2003. In addition to the benefits it offers for the citizens of both Missouri and Kansas, the trail receives support from local industry and the private sector, which are among its strongest advocates."

## Freight Movement In New Jersey

New Jersey expects the movement of goods and cargo by ship, air, rail, and trucks to double within 10 years. Some predictions even indicate that freight movement within the State could be six times higher than current levels by the year 2040. To accommodate and capitalize on this anticipated growth, New Jersey is exploring opportunities for freight-related development on abandoned industrial sites.

New Jersey used funding from the Transportation and Community and System Preservation Pilot Program, which is an FHWA initiative that provides grants to States, local governments, and MPOs to plan and implement strategies that improve the efficiency of the transportation system. Other goals are to reduce the environmental impacts of transportation; lessen the need for future investments in public infrastructure; ensure efficient access to jobs, services, and centers of trade; and explore private sector investments and development patterns that support these goals.




*Josh Curley, New Jersey Institute of Technology*

**New Jersey's urban core is home to many abandoned or underutilized properties. This 5-hectare (12-acre) site is 1.6 kilometers (1 mile) from New Jersey's Meadowlands Sports Complex.**

In January 2003, the North Jersey Transportation Planning Authority (NJTPA) completed a study of brownfield sites in the northern part of the State with the goal of identifying opportunities for freight-related development. The study, which involved conducting market analyses, visiting sites, and developing cases studies on specific properties, revealed that more than 324 hectares (800 acres) of brownfields are available in northern New Jersey.

"We view brownfields as tremendous economic assets, rather than liabilities," says John Hummer, manager of freight initiatives and special projects at the North Jersey Transportation Planning Authority. "New Jersey is one of the most congested States in the country, and space is at a premium. To maximize the efficiency of shipping, warehousing activities should be located in the industrial core near transportation hubs, with easy access to the airport, rail terminals, and highways. Developing warehousing and shipping activities on brownfields reclaims logistically valuable real estate, reduces vehicle-miles traveled for trucks, and creates jobs for an urban workforce."

The anticipated increase in freight activity and related support services is expected to bolster the State and local economy significantly. NJTPA expects that using brownfields for planned transportation improvements will reduce some of the challenges that freight expansion may create, such as roadway congestion, disruptions in suburban and rural life, and increased air emissions.

## Research Results

The FHWA research results show that transportation plays multiple roles in brownfield redevelopment, putting underutilized or unproductive land to better use, increasing the property's attractiveness and appeal for future development, and leveraging limited resources needed for cleanup and development. Considering brownfields while planning transportation projects increases the potential of those sites for redevelopment. Also, redevelopment of brownfields presents opportunities to meet needed transportation goals in pursuit of economic objectives and other community values.

The research differentiates between *brownfield-driven* transportation improvements and *transportation-driven* brownfield improvements. In brownfield-driven improvements, the emphasis is on developing brownfields, and transportation improvements are secondary, pursued in support of the redevelopment. In transportation-driven improvements, the initial focus is on improving some transportation element, which results in improvements in the brownfield site.

*Josh Curley, New Jersey Institute of Technology*

**Poor access is a key obstacle to the development of many brownfield sites. Access to this large site is limited to a single suboptimal underpass of a busy New Jersey Transit commuter rail line.**

Other research findings indicate that States have leveraged a variety of Federal transportation funds for planning and redevelopment activities, including site cleanup. In addition to FHWA's CMAQ and TE programs, States also have used funds from the Federal Transit Administration New Starts and Livable Communities programs for transit-related projects on brownfield sites.

The study revealed that using transportation projects as a means of revitalizing brownfields offers many benefits. In addition to economic development, benefits include environmental remediation, infrastructure renewal, historic preservation, development of a tax base, and job creation. The findings also suggest that certain elements are key to brownfield-transportation redevelopment, including the need to leverage multiple financial resources, the development of public-private partnerships, stakeholder input, and the necessity for a champion to spearhead the project.

Finally, the research showed that opportunities exist for improving access to USDOT and FHWA funds and resources for brownfield redevelopment. Communities could benefit from clearer guidance on the types of funding available, the administrative procedures for accessing them, and ways that they have been used in the past for transportation projects on brownfield sites. Toward that end, FHWA and the Federal Transit Administration in a jointly funded project are gathering new information to revise and update existing guidance on brownfields.

FHWA research indicates the need for further studies that will clarify some of the issues and concerns surrounding brownfield-transportation redevelopment. The current study focused primarily on transportation development on specific brownfield sites. A followup study is underway that focuses on the broader, more regional benefits that result from using transportation projects to redevelop brownfields.

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**Constance M. (Connie) Hill, Ph.D.** is an environmental protection specialist in FHWA's Office of Natural Environment. A member of the Water and Ecosystems Team, Hill is FHWA's specialist in brownfields and hazardous wastes. She serves as her office's research program coordinator and representative on FHWA's Recycling Team. She began her career with FHWA in 1997. She holds a B.S. in geology from Virginia State University, Petersburg, VA, and an M.S. in geology and Ph.D. in urban and environmental studies from Rensselaer Polytechnic Institute, Troy, NY.

*For more information, contact Connie Hill at 804-775-3378 or connie.hill@fhwa.dot.gov*

# Air Quality and Transportation

*by Gary Jensen*

***Emissions are on the decline, and efforts from the Federal to the local levels will help continue this trend.***

Although the Clean Air Act contributes to cleaner air quality, the greatest success can be found in the control of emissions from on-road mobile sources. According to calculations based on data from the *National Air Quality and Emissions Trends Report, 1999*, published by the U.S. Environmental Protection Agency (EPA), emissions reductions from motor vehicles account for 84 percent of the total emissions reductions of the six criteria pollutants since 1970. The automotive, fuels, highway, and transit communities have managed to achieve this success in cleaning up the Nation's air with the help of tight EPA emissions standards and fuel requirements, while at the same time meeting increasing demands for improved mobility and safety.

Although the United States enacted air quality legislation during the 1950s and 1960s, the Clean Air Act of 1970 marked the first time that the country seriously addressed air pollution on a national scale. Amended in 1977, and most recently in 1990, the Clean Air Act provides the principal framework for Federal, State, and local efforts to protect air quality from all pollution sources.

In testimony before the U.S. Senate Committee on Environment and Public Works on July 30, 2002, Federal Highway Administrator Mary E. Peters described the progress made by the U.S. Department of Transportation in reducing transportation-related emissions of pollutants.

"As a Nation, we have made remarkable improvements in reducing air pollution, especially pollution that comes from transportation sources," she said. "Where transportation is a significant source of pollutants, the [U.S.] Environmental Protection Agency reports that ozone—formed by the reaction of volatile organic compounds and nitrogen oxide ($NO_x$), carbon monoxide, and particulate matter—have all decreased substantially since 1970." Added to the atmosphere at the Earth's surface, particulate matter (PM) is fine solid or liquid particles such as dust, smoke, soot, pollen, and soil that could have a potential for significant adverse health and/or environmental impacts.

## Controlling Pollution

Air pollution comes from many different sources: stationary (point) sources such as factories and power plants; smaller area sources like dry cleaners and painting operations; on-road mobile sources including cars, buses, and trucks; and non-road mobile sources such as construction equipment, airplanes, boats, and trains. Air pollution also comes from natural sources such as windblown dust and volcanic eruptions.

Under the Clean Air Act, EPA established Federal controls and standards to reduce emissions. States must

By reducing traffic congestion on highways such as this one, States and metropolitan areas help to improve air quality.

develop and enforce State implementation plans (SIPs) to clean up polluted areas and protect and maintain air quality. Motor vehicle controls are only one part of the picture, but they play a significant role.

EPA established increasingly tighter national standards requiring cleaner motor vehicles and fuels. Also, where Clean Air Act goals are not met, the Act challenges State and local transportation officials to find ways to reduce vehicle emissions by reducing the number of single-occupant vehicles and making alternative modes of transportation, such as transit and bicycles, an increasingly important part of the transportation network.

## Nonattainment Areas

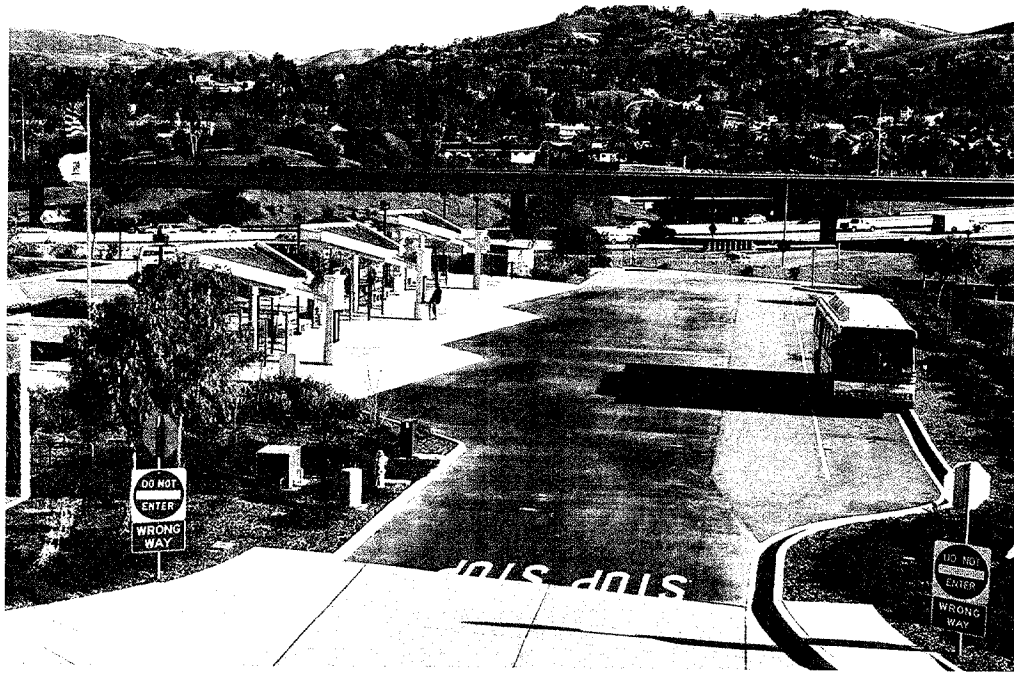
To determine which areas have air pollution problems, EPA and State and local agencies established monitoring networks to measure the concentration of pollutants in outside air. Monitoring data is analyzed to determine if the standards are met. If levels of any pollutant violate the standards, then EPA, in cooperation with the State, designates the contributing area as nonattainment. Once the area again meets the standards for healthy air and has a plan in place to maintain air quality, EPA may redesignate that area back to attainment. Such areas are known as "maintenance areas." Since 1992, the number of nonattainment areas has decreased 46 percent.

In the early 1970s, the Denver, CO, metropolitan area failed to comply with air quality standards for carbon monoxide, $PM_{10}$ (particles with diameters of 10 micrometers or less), and ozone. The carbon monoxide problem was so severe that the area violated the standard more than 130 times a year. At times, the Denver area would be out of compliance continually for days at a time.

Denver air quality improved from 1990 to 1999 with carbon monoxide concentrations decreasing 44 percent, $PM_{10}$ concentrations decreasing 15–17 percent, and ozone concentrations decreasing 12 percent. In 2001, because of these improvements, EPA redesignated the region as attainment for both carbon monoxide and ozone. In 2002, EPA redesignated the area to attainment for $PM_{10}$.

The number of nonattainment areas alone, however, does not tell the whole story. EPA has kept many areas designated as nonattainment for procedural reasons, even though actual monitoring data shows that they are meeting the standards. The most recent EPA data for 1998–2000 show that only 34 areas violated the 1-hour ozone standard (down from 98 areas in 1991), and only 3 areas violated the carbon monoxide standard in 1999–2000.

There are a number of reasons for this. An area may need additional time to resolve technical issues associated with demonstrating that the standards will be maintained. Another reason involves coordination among transportation and air agencies and the public on which projects to fund to maintain the standards or how future emissions targets should be allocated among stationary, area, and mobile sources. Also, State and local legislative bodies may need to act in order to demonstrate that control measures are enforceable.




**Good intermodal connections, such as the one between this transit station and a major roadway, encourage transit use and reduce emissions.**

**Number of Areas Designated As Nonattainment**

| Pollutant | 1992 | 2002 |
|---|---|---|
| Carbon Monoxide | 78 | 24 |
| Lead | 13 | 3 |
| Nitrogen Dioxide | 1 | 0 |
| Ozone | 134 | 74 |
| Particulate Matter ($PM_{10}$) | 84 | 68 |
| Sulfur Dioxide | 53 | 26 |
| All Pollutants | 363 | 195 |

*Source: EPA "Green Book" Web site, Nonattainment Status for Each County by Year, as of January 15, 2001, www.epa.gov/oar/oaqps/greenbk/anay.html.*

**This table shows that the number of areas designated as nonattainment for air quality has decreased between 1992 and 2002, demonstrating that air quality is improving in the United States.**

## Air Quality Standards

EPA's National Ambient Air Quality Standards (also known as "air quality standards") are Federal standards, established through extensive scientific review, that set allowable concentrations and exposure limits for certain pollutants in order to protect public health and welfare. EPA published criteria documents for six pollutants: ozone, carbon monoxide, particulate matter, nitrogen dioxide, lead, and sulfur dioxide. On-road mobile sources primarily contribute to four of these *criteria pollutants*: ozone, carbon monoxide, particulate matter, and nitrogen dioxide.

In 1997, EPA updated air quality standards for ozone (known as the "8-hour" standard as it is based on the measurement of average concentrations over an 8-hour period) and fine particulate matter (known as the $PM_{2.5}$ standard, for particles with diameters of 2.5 micrometers or less). These standards were challenged in court, and until recently,

litigation blocked their implementation. The Supreme Court now has upheld these standards, and a lower court dismissed further challenges. EPA is developing a plan for implementing the standards and expects nonattainment areas to be designated and required to develop SIPs to meet them in the upcoming years.

The Federal Highway Administration (FHWA) anticipates that these updated standards will affect a much larger number of areas than are currently in nonattainment. Identifying strategies and measures that will enable nonattainment areas to meet the standards may be substantially more difficult. In addition, the transportation contribution to $PM_{2.5}$ emissions is unclear, so additional research will be necessary to determine how transportation strategies can control $PM_{2.5}$ emissions.

## Cleaner Air

As a Nation, and as transportation officials and citizens, we have had great success under the Clean Air Act. National levels of all criteria pollutants are down over the last 20 years. Ozone levels nationally have improved considerably. Although some areas have shown increases, ozone levels in urban areas where problems historically have been the most severe show marked improvement in response to stringent controls. Nationally, carbon monoxide levels are the lowest recorded in the last 20 years, and this air quality improvement is consistent across all regions of the country. The most recent 10-year period (1990–1999) shows that the national average of annual mean $PM_{10}$ concentrations decreased 18 percent.

For example, air quality in the Los Angeles area—the only area in the country classified as *extreme* nonattainment for ozone—has improved significantly, thanks to the comprehensive control strategies implemented to reduce pollution from mobile and stationary sources. For instance, the total number of days the area exceeds the 1-hour ozone standard has decreased dramatically over the last two decades from more than 200 days to fewer than 50 days per year.

On July 30, 2002, Jeffrey Holmstead, assistant administrator of EPA's Office of Air and Radiation, offered testimony before the Senate Committee on Environment and Public Works. Holmstead explained that the United States has made "considerable progress" in achieving better air quality since the passage of the Clean Air Act Amendments in 1990.

"Air quality monitoring data show that in the period from 1991 to 2000, concentrations of all six criteria pollutants have declined," he said, "including the four criteria pollutants that are most affected by the transportation sector: carbon monoxide, nitrogen dioxide, ozone, and particulate matter. For example, air quality concentrations of carbon monoxide declined 41 percent and concentrations of coarse particulate matter declined 5 percent."

He concluded, "These air pollution data are good news, and are attributable to the transportation and air quality programs currently in place."

## ISTEA and TEA-21

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) revamped the Federal highway and transit programs to provide State and local officials with additional tools to improve air quality, including flexible funding increases, a strengthened planning process, and programs specifically directed to improving air quality and transit. ISTEA required that States and metropolitan planning organizations (MPOs) carry out a comprehensive process for transportation planning and offered State and local officials flexibility in choosing among highway, transit, and other transportation alternatives that would enable them to select the best mix of projects to address air quality.

ISTEA also created the Congestion Mitigation and Air Quality Improvement Program, which directs funding to projects and programs that reduce emissions in nonattainment and maintenance areas. In 1998, the Transportation Equity Act for the 21st Century (TEA-21) continued the provisions of ISTEA and significantly increased funding for transportation programs and projects that reduce emissions from motor vehicles.

## Transportation Planning And Conformity

ISTEA strengthened the planning process by requiring States and MPOs to develop better transportation plans that could help improve air quality. The requirements of ISTEA were matched with a provision in the 1990 amendments to the Clean Air Act limiting Federal transportation activities in nonattainment and maintenance areas under certain circumstances. This provision in the Act, intended to integrate the transportation and air quality planning processes, is known as "transportation conformity."

The provision is a way to ensure that Federal funding and approval goes to those transportation activities that are consistent with air quality goals. A conformity determination demonstrates that the total emissions projected for a transportation plan and program are within the emissions limits (or budgets) established by a SIP, and that transportation control measures (TCMs) are implemented in a timely fashion.

By 2001, a very high percentage (94–100 percent) of nonattainment and maintenance areas had developed transportation plans that met emissions reduction goals.

## Population and Travel Growth

The United States achieved these improvements in air quality despite dramatic increases in population and personal and freight-related travel. According to the U.S. Census Bureau, between 1970 and 1999, the U.S. population increased 38 percent, and the number of people employed grew 68 percent. The Bureau of Economic Analysis in the U.S. Department of Commerce reports that the gross domestic product, adjusted for inflation, increased 147 percent during that time. And, according to FHWA statistics, the number of drivers increased 68 percent, the total vehicle miles traveled (VMT) per year grew 142 percent, and heavy-duty truck travel increased 227 percent. At the same time, however, EPA estimates that total on-road motor vehicle emissions *decreased* 77 percent.

Transportation planners not only face increases in personal and freight-related travel, but they also contend with other challenges in accommodating growth. For example, actual construction of new and expanded lanes on the Nation's highway system during the last 20 years increased system capacity by only 3 percent, according to FHWA's Office of Highway Policy Information.

Not surprisingly, congestion has grown steadily over the last two decades in urban areas of every size. Severe congestion lasts a longer period of time and affects more of the transportation network (as seen in 1999 statistics) than it did in 1982. In fact, in its *2001 Urban Mobility Study*, the Texas Transportation Institute reported that the average annual delay per person rose from 11 hours in 1982 to 36 hours in 1999.

Other challenges include reducing the number of people who travel by single-occupant vehicles, encouraging travel by other modes, and decreasing the number of trips that motorists make. According to the U.S. Census Bureau, the majority of commuters in the United States rely on single-occupant vehicles to travel between home and work.

## Emissions Trends in Transportation

Despite large increases in population, personal travel, and freight transportation; limited highway expansion; and the public's choices of transportation modes, on-road motor vehicle emissions declined 77 percent since 1970, as noted earlier. And EPA expects this downward trend to continue well into the future.

In addition to the reduction in emissions levels, the contribution of emissions from on-road motor vehicle sources has decreased as a percentage of total emissions. In fact, in 1970, motor vehicles contributed 59 percent of total emissions of carbon monoxide, nitrogen oxide, volatile organic compounds, and particulate matter, compared to stationary, area, and non-road mobile sources. By 1999, the motor vehicle portion of emissions of these pollutants dropped to 48 percent.

## Stricter Standards

The majority of these emissions reductions resulted from stricter standards, improved engine technology, and cleaner fuels. Engines and fuel will become even cleaner under recent EPA-issued emissions standards and cleaner fuel requirements.

Between 2004 and 2007, more protective tailpipe emissions standards will be phased in for all passenger vehicles, including sport utility vehicles (SUVs), minivans, vans, and pickup trucks. This regulation marks the first time that larger SUVs and light-duty trucks will be subject to the same national pollution standards as cars. In addition, EPA lowered standards for sulfur in gasoline, which will ensure the effectiveness of low-emission control technologies in vehicles and reduce harmful air pollution.

Once implemented, the new tailpipe and sulfur standards will benefit Americans by offering the clean-air equivalent of removing 164 million cars from the road. The new standards require passenger vehicles to be 77 to 95 percent cleaner than those on the road today, and reduce the sulfur content of gasoline by up to 90 percent.

EPA recently issued new standards as well for heavy-duty highway engines that will take effect in model year 2007. These standards are based on the use of high-efficiency catalytic exhaust devices to control emissions or comparably effective advanced technologies. Because sulfur damages the devices, EPA also is reducing the level of sulfur in highway diesel fuel by 97 percent by mid-2006. As a result, each new truck and bus will be more than 90 percent cleaner than current models. EPA expects the clean air impact of the program to be dramatic when fully implemented. The program will provide annual emissions reductions equivalent to eliminating the pollution from more than 90 percent of today's trucks and buses—about 13 million—from America's roadways.

Even in fast-growing areas such as Atlanta, GA, motor vehicle emissions are expected to continue a downward trend. The Atlanta Regional Commission estimates that emissions of $NO_x$ and VOCs will decrease 37 percent and 25 percent respectively between 2005 and 2025.

## Cleaner Air for Tomorrow

On a national level and at the local level in almost all metropolitan areas around the country, air quality is improving. From 1990–1999, only 9 percent of metropolitan areas had an upward trend in ozone concentrations, only 1 percent of metropolitan areas had an upward trend in the concentrations of particulate matter, and no metropolitan areas had an upward trend in carbon monoxide.

Reducing pollutant emissions from motor vehicles has been a major factor in this trend toward cleaner air. Technological innovations, cleaner fuels, and highway and transit programs have reduced emissions significantly over the past 30 years and will continue this trend well into the future.

**Urbanites descend an escalator into a subway station that received Federal funding.**

**Gary Jensen** is a member of the Transportation Conformity Team in FHWA's Office of the Natural and Human Environment. He is involved in developing policies and guidance associated with transportation conformity and other air quality issues. He has been with FHWA for 8 years. Prior to his current assignment, he spent 4 years in FHWA's Tennessee Division Office managing transportation planning and environmental programs. He holds a degree in civil engineering from the University of Idaho.

*For more information about transportation and air quality, visit www.fhwa.dot.gov/environment/aqupdate/index.htm or contact Gary Jensen at 202-366-2048 or gary.jensen@fhwa.dot.gov.*

# Solutions from the Sunbelt

by Alex Levy

***The southeastern States share strategies to protect wildlife and fragile habitats.***

The southeastern United States is one of the fastest-growing regions in the country. According to a study conducted by the Southern Rural Development Center at Mississippi State University, population growth in the region averaged 20 percent over the decade from 1990 and 2000. Combining a temperate climate, relatively low living costs, a highly developed network of modern interstates and other highways, and freight rail lines that historically moved cotton and produce from farm to market, the South continues its legacy of growth; however, today the Southeast also is sprouting urban sprawl.

Providing the foundation for the remarkable growth in the eastern Sunbelt are some of the most resilient and fragile associations of living organisms on the planet. The plants and animals in these ecosystems represent some of the most biologically diverse species on Earth. Ample streams, rivers, wetlands, and terrestrial habitats support this biodiversity.

According to classifications by the U.S. Department of Interior's U.S. Geological Survey, the ecosystems in the South range from the spruce-fir forests of the highest points of the southern Appalachian Mountains to the tropical hardwood hammocks of southernmost Florida. In between these extremes lies a diversity of indigenous habitats: the old-growth deciduous and hemlock forests, cliffs, rocky stream gorges, and grassy and heath balds of the Appalachians; the sawgrass marshes, mangrove forests, and pine rocklands of south Florida; the carnivorous plant wetlands, baldcypress swamps, live oak maritime forests, longleaf pine savannas, and dunes of the coastal plain; the oak-hickory forests, bottomland forests, prairies, glades, and barrens of the piedmont and continental interior; and the springs and extensive cave systems of limestone areas.

The most saturated of these habitats represent nearly 80 percent of the Nation's dwindling wetlands. Such biodiversity may be nature's way of ensuring species survival through genetic variability, but in human nature lies the capacity to sustain—or subdue—millions of years of natural history with relatively minor actions.

With the blossoming human population, a growing network of transportation corridors is emerging on the Southeast's sand, peat, limestone, and red clay soils. Along with this growth, State departments of transportation (DOTs) are demonstrating the valuable role that they can play in protecting and enhancing wildlife habitats throughout the region. The southeastern States are planning, building, and retrofitting roads with measures to improve landscape connectivity, reduce roadkills, and protect human lives and property from animal-vehicle collisions.

Jay Cline, LA DOTD

**Thought by many to be the southernmost remnant of glaciation, the Tunica Hills area of West Feliciana Parish—including the forested plateau shown here—provides home to some plant species that are related more closely to species endemic to the Appalachian Mountains than to other species in this part of Louisiana.**

## Florida

In 1993, responding to the need for an interstate-level upgrade of Alligator Alley, a major east-west corridor across the Everglades, the Florida Department of Transportation (FDOT) and the Federal Highway Administration (FHWA) wrestled

with finding a safe, effective, and economical solution to address significant highway mortality rates for the federally listed endangered Florida panther.

Populations of this close cousin of the western mountain lion have dwindled to a staggeringly low number. Perhaps the largest native predator in the eastern United States, the Florida panther is a subspecies that is commonly thought to represent the only known remnant of the eastern cougar that once inhabited much of the Southeast.

For the Alligator Alley highway, FDOT's solution was a series of constructed highway underpasses, coupled with extensive right-of-way fencing. The fences direct the big cats away from the roadside while still accommodating their need to move throughout large territories to hunt. FDOT also is making wildlife underpasses a more routine part of the State's highway and tollway systems.

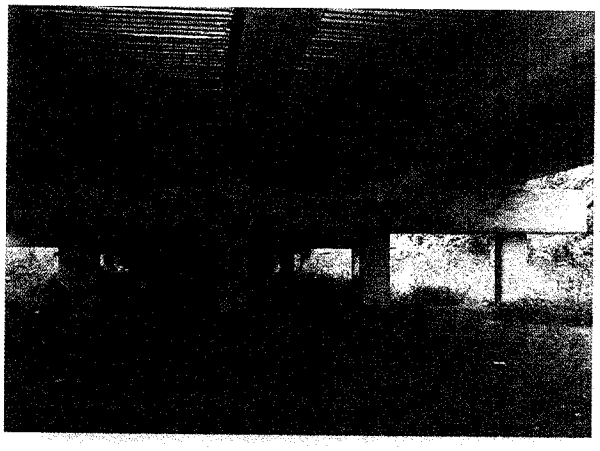
Since installation of the underpasses, no Florida panthers have been killed on Alligator Alley. For additional information about wildlife underpasses, see the proceedings from the International Conference on Ecology and Transportation at www.itre.ncsu.edu/cte/icoet.

Not only does Florida stand out as a southeastern pioneer of habitat connectivity, but also the State was the host for the first International Conference on Wildlife Ecology and Transportation. Now in its 8th year, the biennial event has broadened its mission to become the International Conference on Ecology and Transportation—the only international, interagency event addressing the broad range of ecological issues related to surface transportation.

**Opened in late 2000, this bridge over I–75 just north of Ocala, FL, creates a visual barrier for recreational trail users crossing the highway. The vegetative buffer and natural surface of the bridge also attracts use by some of the area's wildlife. Florida's Fish and Wildlife Conservation Commission is monitoring nighttime usage of the bridge with motion-sensitive cameras.**

More recently, FDOT and 22 other agencies representing Florida and the Federal government signed a memorandum of understanding to make transportation decisions more efficient while protecting the human and natural environment. The new process streamlines planning by engaging all stakeholders earlier in a project, establishing interagency teams to coordinate reviews and ensure agency interaction throughout the life of a project, and identifying critical issues earlier to result in better transportation decisions for the environment and the public.

The State continues the tradition of protecting habitat connectivity that it began with Alligator Alley through numerous projects, including underpasses for black bears north of the Ocala National Forest, land-management strategies for the federally listed key deer, barrier walls with underpasses to reduce amphibian and reptile mortality along US 441 through the Paynes Prairie Preserve, and a greenway-trail overpass on I-75. Other initiatives and actions include creating "habitat banks" (conservation areas) for rare and listed wildlife such as the red-cockaded woodpecker and reducing oceanfront street lighting during the summer to protect sea turtles during their nesting and hatching season.

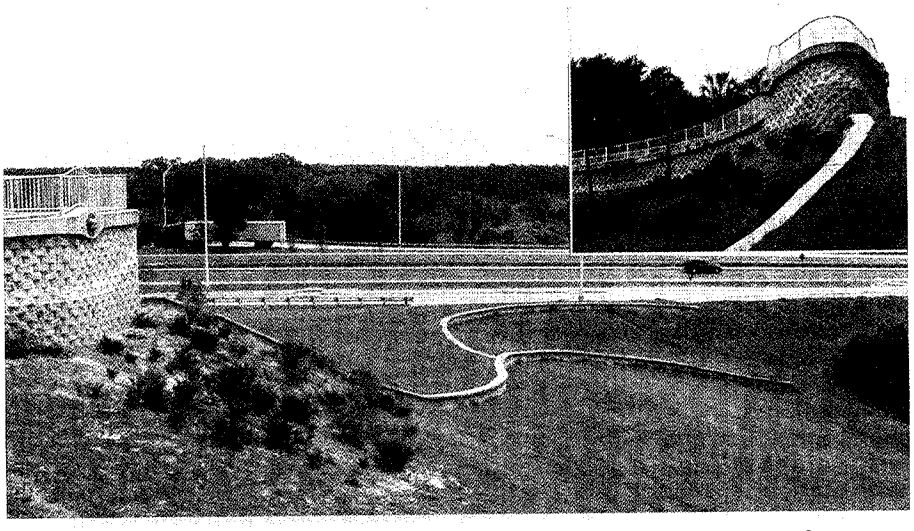


**Northeast of Orlando, FDOT and the Florida Fish and Wildlife Conservation Commission are using bridge extensions like this one, a constructed culvert, and extensive fencing and signage to improve safe movement for bears and raise awareness about the presence of one of Florida's State-protected species.**

## Alabama

To complement its statewide collection of successful wetlands mitigation banks (offsite land resources set aside to mitigate the impacts of transportation projects), the Alabama Department of Transportation (ALDOT) is in the process of establishing a habitat bank for the relocation and recovery of the gopher tortoise within the threatened western portion of its range. Occupying burrows deep in the sands of the Southeast's coastal plain, these reptiles have suffered decreases from hunting, habitat loss, and the reckless dumping of gasoline into their burrows to drive out the rattlesnakes that often share their dens.

In preparing to widen a portion of US 98 through gopher tortoise habitat west of the City of Mobile, ALDOT became the lead partner in an effort to restore several hundred acres of suitable habitat that will receive animals relocated from the project rights-of-way. In addition, ALDOT plans to deter the remaining tortoise population living near US 98



**A rest area along I–75 southbound near Paynes Prairie State Preserve in Florida boasts this whimsical scenic overlook in the shape of a snake. It simultaneously offers visitors unobstructed views across the prairie and serves as a barrier to prevent snakes from entering the rest area.**

from entering the completed roadway by installing buried fencing.

Auburn University's Harbert Engineering Center also joined the team to facilitate technology transfer to advance applications that will help minimize animal-vehicle collisions throughout Alabama.

## Georgia

Over the past decade, the Peach State successfully created several habitat banks and relocated the federally protected red-cockaded woodpecker and State-listed gopher tortoise. In addition, the Georgia Department of Transportation (GDOT) used highly visible red spheres—required by the Federal Aviation Administration for use on electrical transmission lines near runways and airports—to deter threatened woodstorks from becoming entangled in power lines above roadside foraging areas.

GDOT also is improving fish passage and protecting aquatic habitat for freshwater mussels with design and construction enhancements at road crossings over streams. Bridge extensions are increasingly commonplace as underpasses for wildlife movement. For a widening project along US 80 between Savannah and coastal Tybee Island, GDOT is considering the use of underpasses and curbing to protect the diamondback terrapin—an Atlantic coast turtle—while its population nests along the roadside shoulders.

## North Carolina

Recently, the North Carolina Department of Transportation (NCDOT) and the North Carolina Department of Environment and Natural Resources embarked on a joint venture to create a new program to identify lands characteristic of the State's biodiversity from Mount Mitchell, the highest point in the eastern United States, to the rugged Outer Banks along the continental shelf of the Atlantic Ocean. The goal is to leverage mitigation from transportation projects to achieve broad protection and public ownership of these places.

Even before this project, NCDOT already was developing three underpasses for coastal black bears on a State-aid project. To reduce controversy on this project, NCDOT also committed to the construction of a more context-sensitive roadway and avoided possible impacts on several high-quality wetlands by incorporating bridges into the project. NCDOT also committed to funding 2 years of preconstruction monitoring and 2 years of followup studies to evaluate the success of these measures.

In the rapidly growing Raleigh-Durham area, NCDOT is proposing bridge extensions to improve wildlife mobility. At the same time, NCDOT is advancing studies on the use of existing underpass structures by whitetail deer to help the agency set more accommodating standards for underpass design.

## Tennessee

In Unicoi County, TN, the Tennessee Department of Transportation upgraded US 23 to interstate standards in anticipation of incorporating the roadway into I-26. The economically important corridor connects Bristol, Johnson City, and Kingsport—Tennessee's northeastern Tri-Cities area—to Asheville and the North Carolina side of the Great Smoky Mountains National Park.

In 1996, FHWA recognized the carefully planned, designed, and constructed 24-kilometer (15-mile) section with an award of excellence in rural highway design. While providing economic, social, and aesthetic benefits to the surrounding communities and motoring public, the project preserved the natural integrity of the landscape and included two underpasses built to accommodate the movement of black bears and other native wildlife safely across the corridor.

## Kentucky

Known worldwide for the horse farms on its rolling bluegrass hills, Kentucky also boasts biological diversity supported by the Ohio River that forms the State's northern and western borders, the Cumberland River in the southernmost part of the State, and a rolling karst terrain made famous by the subterranean caverns in southwestern Kentucky's Mammoth Cave National Park.

The Kentucky Transportation Cabinet (KYTC) has implemented several initiatives to address wildlife-vehicle collisions and habitat fragmentation, including traditional highway signage and fencing. The State also has made limited use of prismatic reflectors that bounce light from headlights at a 90-degree angle toward the side of the road to warn large animals away from roads and highways.

KYTC also has used bridge extensions for wildlife underpasses. In the western part of the State at Land Between The Lakes, KYTC is working with the U.S. Forest Service to incorporate underpass culverts to accommodate the foraging and migratory movements of large animals, including a reintroduced population of elk.

"Everybody wins in Kentucky when transportation changes em-

Bart Sutton, LA DOTD

**In Pointe Coupee Parish, Louisiana will use global positioning systems to document the location of large cypress trees, like this one in a ponded swale, to determine a highway alignment that will minimize the impact on trees that could serve as dens for the federally protected Louisiana black bear.**

brace environmental stewardship and public involvement," says A. Olivia Michael, environmental program manager and right-of-way officer for FHWA's Kentucky Division. "Habitat awareness and conservation now are part of the context-sensitive design approach for transportation. We now have greater public ownership in our projects, as well as added safety benefits when we prevent animal collision incidents."

Kentucky is no stranger to installing culvert underpasses for cattle and farm equipment crossings. Currently, KYTC is investigating the possibility of constructing its first wildlife bridge overpasses for a portion of the proposed I-69 alignment and other existing interstates where animal-vehicle collisions are common.

On another front, KYTC's operations and maintenance staff are controlling vegetation to prevent the colonization of invasive species. Also, KYTC is working with the U.S. Department of Interior's Fish and Wildlife Service (USFWS) to use roadside maintenance practices that favor the Eggert's sunflower, a regionally rare species.

## Arkansas

Although Arkansas is located on the western side of the Mississippi River, culturally and ecologically it is tied to the Southeast and is one of the first southern States to embrace the concept of mitigation banking for wetland habitats. Arkansas continues to lead by example in partnering with Federal resource agencies to streamline decisionmaking processes for environmental-transportation projects, resulting in better use of public funds for transportation and resource conservation. Finally, the Arkansas Highway and Transportation Department has combined fencing and box culverts to create the State's first designated wildlife underpasses just north of Little Rock.

## Louisiana

Nicknamed a Sportsman's Paradise, Louisiana bayous and natural areas teem with wildlife. The Louisiana Department of Transportation and Development (LA DOTD) is engaged in several projects located in known habitat of the threatened Louisiana black bear, a subspecies of its more common North American cousin. LA DOTD is providing underpass crossings, while simultaneously working with resource agencies to ensure the value of the investment in these measures by protecting adjacent habitats.

On one 19-kilometer (12-mile) project, the St. Francisville Bridge over the Mississippi River, LA DOTD is including 10 culvert underpasses and nearly 5,486 meters (18,000 feet) of elevated roadway to cross wetlands, provide hydraulic passage, conserve habitat for the Louisiana black bear, and meet its mobility requirements. Additional conservation techniques during this project include (1) coordination with USFWS throughout construction, (2) special coordination during construction of the subsurface culvert in areas of potentially active black bear movement, and (3) education of construction personnel about the presence of Louisiana black bears and courses of action if sightings should occur.

Between New Orleans and Lafayette, another project—the Interstate 49 extension—proposes to upgrade an existing divided highway to interstate standards. Here, LA DOTD also is considering creating cost-effective black bear underpasses while leveraging the local community's interests and resource agency responsibilities to protect the integrity of the habitat that lies beyond the pavement. Securing the bears' ability to access their natural habitat in the swamps of the nearby Atchafalaya River is critical to the value of the public's investment in crossing structures.

"People usually perceive highways as fragmenting habitat," says Michèle Deshotels, executive management officer for environmental policy and streamlining at LA DOTD, "but here in Louisiana, highways and railroads proved to be the sole source of one remnant habitat. Fifteen years ago, it was thought that all prairie was gone from Louisiana. It was a marvelous find to realize that fragments of real prairie remained intact in highway right-of-ways. Since then, we have been doing what we can, not only to preserve what we have, but also to help restore this habitat around our State. We are even in the process of putting up informative signage to mark some of the locations of prairie in our rights-of-way."


David Soileau, Jr., USFWS

**In spring 2003, the U.S. Fish and Wildlife Service and Louisiana Department of Transportation and Development staff installed bear crossing signs along US 90 (future I–49) from Calumet to Berwick, LA, to alert motorists to the potential for bears crossing the road.**

## South Carolina

The South Carolina Department of Transportation (SCDOT) incorporated wildlife crossings into several projects. Most recently, SCDOT extended a bridge spanning wetlands on the Carolina Bays Parkway to facilitate constructing an upland wildlife crossing.

According to Patrick Tyndall, environmental coordinator for FHWA's South Carolina Division, extending the bridge was unnecessary from a hydraulic standpoint. "However," he says, "our partners at the USFWS and the South Carolina Department of Natural Resources (SCDNR) informed us that this area—known as the Socastee Swamp—serves as an important wildlife corridor. Therefore, through a mutual agreement, the bridge was extended to include an upland wildlife crossing."

SCDOT embraced the design-build concept (a single procurement for the design and construction of projects) in the mid-1990s to reduce the costs of constructing transportation projects. The first major design-build project was the Conway Bypass, a 45-kilometer (28-mile) new roadway near popular Myrtle Beach. SCDOT incorporated wildlife crossings for various animal species known to inhabit the area.

A major concern was the potential impact on a little-known population of black bears. SCDOT urgently needed information on this last remaining population of bears on South Carolina's coastal plain, both to develop meaningful strategies that would ensure their continued existence in the face of increasing development and to reduce the safety hazard of animal-vehicle collisions.

SCDOT determined that the most practical solution was to design bridges and culverts. Initial estimates indicated a need for nearly a dozen structures ranging from extra culverts to specially designed bridges—all at an added cost in the millions of dollars.

Representatives from SCDOT, SCDNR, Clemson University, and the design-build contractor met to modify the number and location of proposed underpass structures. As a result, the new plan eliminated seven 91-meter (300-foot)-long culverts and eight 38- to 46-meter (125- to 150-foot)-long bridges, resulting in a savings of more than $2 million.

With the cost savings, SCDOT and its contractor agreed to fund a black bear study. Recently completed by Clemson University, the study documents the movement, abundance, habitat utilization, and population dynamics of South Carolina's coastal black bear population. Data gathered during the study will enable more accurate placement of wildlife crossings on future projects and facilitate longer-term protection of black bears from vehicular conflicts.

"Rather than arbitrarily picking locations for wildlife crossings," Tyndall says, "SCDOT paid Clemson University to conduct a study of black bear movements to see where the crossings would be needed. In the end, this allowed wildlife crossings to be placed only where they truly are needed."

## A New Outlook

Clearly, every State DOT in the region is responding to growth pressures as opportunities for investment in a better quality of life and improved conservation of public resources. The most conspicuous indicators of the southeastern transportation community's emerging environmental ethic are coming from the many collaborative approaches to developing transportation projects and resource stewardship initiatives.

Funding flexibility, enabled by Federal transportation legislation such as the Intermodal Surface Transportation Efficiency Act and the Transportation Equity Act for the 21st Century, is one key element. FHWA policies that reflect increasing expectations for States to do more with limited transportation resources are another key in advancing innovative solutions and collaborative interagency approaches that go beyond satisfying environmental outcomes. In addition, the charge to streamline the lengthy, and at times redundant, environmental regulatory processes has led local, State, and Federal transportation and resource agencies to understand that transportation decisions are tied intimately to environmental decisions.

This growing understanding continues to transform the South's attitude toward transportation and the environment. Not to be lost in the big picture of economic sustainability is the importance of quality-of-life issues that require clean air and clean water. Human communities are inescapably linked to the indigenous natural communities that are the foundation of the region's resources and ultimately determine the productivity of the land and its people.

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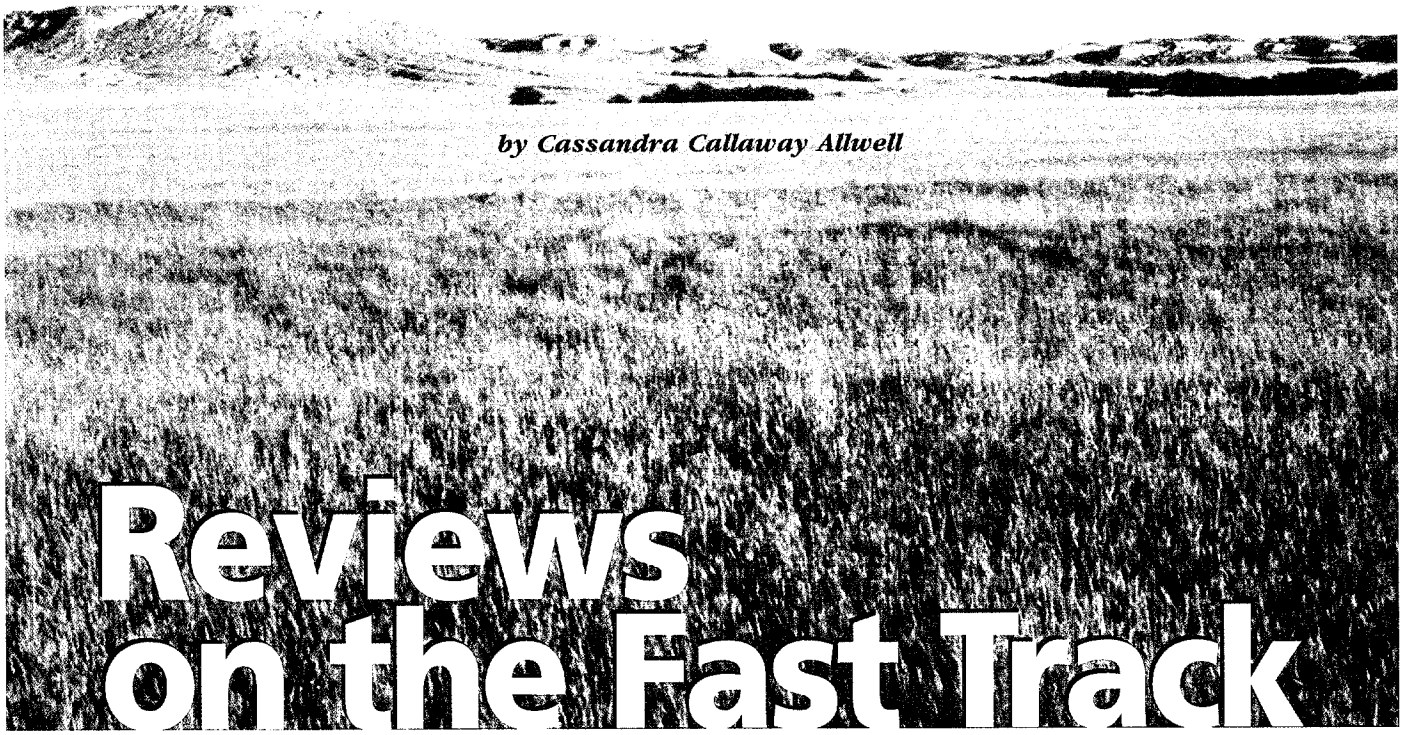
**Alex Levy,** an Atlanta native, has served as an ecologist in FHWA's Resource Center for the last 3 years. Levy brings to FHWA more than a decade of public and private sector experience conducting field studies and coordinating ecological assessments for transportation, utility, and site developments. With a bachelor's degree in landscape architecture from the University of Georgia, Levy conducts site-analyses that result in better decisionmaking and context sensitivity for integrating the built and natural environments. Levy assists State DOTs, FHWA Division Offices, and resource agencies as they work to improve the quality of existing and future surface transportation for both two- and four-legged stakeholders.

*A step-by-step guide to practices that States employ to streamline the environmental review process.*



*by Cassandra Callaway Allwell*

# Reviews on the Fast Track

Three years ago, representatives from the Colorado Department of Transportation (CDOT) met with conservation agencies and organizations to discuss partnerships for contributing to species recovery and ecosystem conservation within the State's short-grass prairie habitat. The U.S. Fish and Wildlife Service (FWS) and Colorado Division of Wildlife agreed that preservation of healthy ecosystems to sustain viable populations of endangered species in key areas would be of greater benefit than remediation in the transportation corridor, located next to high-speed traffic.

This cooperative spirit and willingness to consider creative solutions, starting with species habitat needs and ecoregional priorities rather than project-by-project regulatory check-offs, ultimately gave birth to an innovative 36-species, habitat-based impact analysis and a focused conservation investment. High-quality, short-grass prairie habitats will be purchased in advance of highway construction projects as a mitigation measure to preserve the identified species that depend upon them. The short-grass prairie habitat under priority consideration is located in areas spanning from the Colorado-Wyoming border south to the Comanche National Grasslands, the foothills of the Rocky Mountains, and the largest, multihabitat conservation site in far southeastern Colorado. The mitigation purchases will compensate for impacts caused by CDOT transportation improvements on the existing highway network located within short-grass prairie habitat for the next 20 years.

"It's challenging trying to balance the need to protect the environment while providing a safe transportation system for a growing State," says Tom Norton, executive director of CDOT. "However, CDOT is committed to doing just that. We recognize how important it is to preserve short-grass prairie and protect the wildlife dependent upon it."

The short-grass prairie initiative provides habitat mitigation prior to project development and construction for endangered and threatened species, therefore, reducing the time necessary for coordinating with the FWS. Reductions in coordination time will expedite the release of environmental documents and the issuance of the environmental permits necessary for project construction.

This Colorado conservation achievement provides an exceptional example of "environmental streamlining," which may be defined as "completing reviews and permitting in an efficient way, while ensuring that projects are environmentally sound." Since the enactment of the Transportation Equity Act for the 21st Century (TEA-21) in 1998, the Federal Highway Administration (FHWA) has focused on reducing the length of time to process environmental documents for major transportation projects while remaining effective environmental stewards.

Streamlining entails establishing realistic timeframes for transportation and environmental resource agencies to develop projects, and then working cooperatively to adhere to those timeframes. The coordination of multiple overlapping environmental reviews, analyses, and permitting actions is essential to achieving realistic timeframes.

A number of Federal agencies are charged with statutory oversight of specific environmental resources. In addition, most States and some local jurisdictions have their own environmental statutes and requirements that also must be addressed.

**(Above) Colorado shortgrass prairie.** *Photo courtesy of ©Harold E. Malde. Permission to print in this issue of PUBLIC ROADS only.*

The complexity of the processes involved in developing transportation projects, the multiple actions, and the varying requirements do not lend themselves to quick solutions. But to streamline the process, sponsors at the regional, State, and local levels need to coordinate their timeframes and solutions.

Experience in developing and implementing streamlining solutions indicates that the most effective practices occur at the project level. Every State DOT has adopted or initiated processes and procedural agreements or initiatives that clarify, amend, or reinvent the development process for transportation projects. Because of these efforts, State and local highway and transit agencies have achieved considerable direct and tangible results.

## Streamlining Practices in Action

Sponsors of transportation projects employ a variety of streamlining practices to speed up costly and time-consuming environmental reviews. Successful practices need not be innovative per se: they simply must be effective and efficient. Many of the successful streamlining practices fall into one of six categories:

1. Integration of planning and project development processes
2. Use of context-sensitive designs and solutions
3. Development of programmatic agreements
4. Use of flexible mitigation
5. Expenditures on technology, training, and staff
6. Employment of alternative dispute resolution

A review of these practices provides a step-by-step guide to environmental streamlining.

## Integrated Planning

An integrated, concurrent process requires early involvement in the planning phase by State and Federal resource agencies, enabling them to provide their input on the purpose of the transportation project, the need for it, and the screening of preliminary alternatives. An example of a broad-based, integrated process is Florida's efficient transportation decisionmaking, which brings agency interaction forward into the early stages of transportation planning, identifies avoidance and minimization strategies much earlier, and builds cost impacts for these strategies into the long-range transportation plan.

Missouri DOT

**Congestion on Interstate 70 in Missouri.**

Other examples are Oregon's and Washington State's efforts to determine modal and location aspects for the National Environmental Policy Act (NEPA) process during the corridor planning stage. The Oregon DOT then conducts further environmental documentation and analysis when projects become funded and are developed for construction.

Indiana's streamlined environmental impact statement procedures allow the documentation developed by FHWA and the Federal Transit Administration in compliance with NEPA to serve as a substantial part of the documentation required by other permitting and funding agencies in accordance with applicable laws and regulations. Maryland focuses on more explicitly incorporating various agency coordination and regulatory requirements into a single unified process, thereby improving the overall timeliness of project decisions.

These State DOT efforts are among others that are making significant efforts to link the planning and NEPA processes. The intended outcome is to make planning and project development seamless, more connected, and more systematic.

Almost half of the State DOTs have focused on integrating planning and project development activities to eliminate duplication of effort between initial transportation planning and NEPA studies, resulting in more efficient decisions. A coordinated review process evaluates environmental issues concurrently, rather than sequentially.

"Tiering" is a specific approach for organizing decisionmaking concurrently for large transportation projects rather than sequentially. Tiering integrates the planning and NEPA processes in two phases: a first tier focused on broad, overall corridor issues, such as general location, mode choice, and areawide air quality and land use impacts; and a second tier focused on site-specific impacts, costs, and mitigation measures.

The Missouri DOT and FHWA's Missouri Division are using tiering to address the long-range environmental concerns for a 322-kilometer (200-mile) section of I-70. Says Director Henry Hungerbeeler of the Missouri DOT, "Interstate 70 is the most important corridor in the State; it connects our two largest cities and is crucial to the State's economy." The Missouri DOT anticipates that the I-70 tiering process will take approximately 4 years to complete, rather than the 6 to 7 years complex corridor studies typically take in Missouri. For more information, see www.improvei70.org.

## Context-Sensitive Designs

Context-sensitive designs and solutions exemplify how partnerships with public and resource agencies can yield transportation projects that meet a variety of needs while promoting environmental stewardship. Context-sensitive solutions seek to integrate highways into the communities they serve by balancing preservation of community values, enhancement of the natural environment, safety, and mobility.

Guided by the *Listen-Understand-Design-Build* motto, Minnesota DOT (Mn/DOT) began its context-sensitive design efforts in 2000. Interdisciplinary teams of economic, environmental, and social experts develop projects that fit functionally, culturally, and environmentally within their location. In addition, Mn/DOT provides training in project management and context-sensitive design for its staff and those from resource agencies.

Connecticut, Kentucky, Maryland, Minnesota, and Utah served as pilot States to implement this new approach to transportation decision-

making. They implemented new policies on transportation project development, staff training, conferences, research, and community outreach. The following principles may help States adopt context-sensitive solutions:

- Develop projects through a collaborative process that actively engages communities and other stakeholders early and often.
- Balance safety, mobility, and economic goals with the preservation of environmental, scenic, aesthetic, historic, and cultural values.
- Build projects that add lasting value to communities and minimize disruption.
- Implement a flexible design process that is sensitive to project goals, timelines, and the environment.
- Exceed the expectations of designers and stakeholders.

## Programmatic Agreements

Programmatic agreements are legal documents defining how each participating State and Federal agency will be involved in the review of projects. Most of the agreements address historic preservation, navigable waters and wetlands, endangered species, and public lands. In many cases, these agreements allow projects that fall within certain defined criteria to be reviewed according to previously negotiated procedures, avoiding lengthy coordination processes on uncomplicated projects.

*Historic preservation.* At last count, 41 States have some level of delegated authority for historic resources, enabling many projects to be processed quickly and freeing State and Federal resources to focus on other issues. In Vermont, a programmatic agreement enables the Vermont Agency of Transportation (Vtrans) to complete almost all reviews required by Section 106 of the National Historic Preservation Act in-house. The Vermont State *Manual of Standards and Guidelines* documents the details of the programmatic agreement between FHWA, Vtrans, the Advisory Council on Historic Preservation, and the Vermont State Historic Preservation Officer.

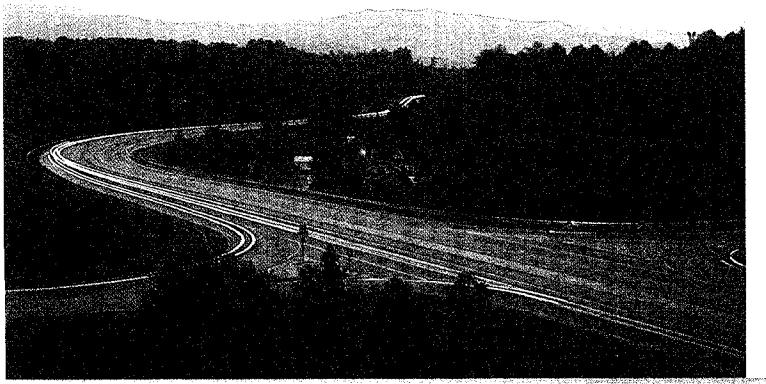
"After 2 years of implementation, I can confidently state that the programmatic agreement has substantially reduced the time needed to permit projects," says D. Scott Newman, historic preservation officer with the Vermont Agency of Transportation. "And resource stewardship has improved through Vtrans' ownership of the review process. The *Manual of Standards and Guidelines* lays the groundwork for effective consideration of historic properties in the early stages of project development; this means far fewer expensive and time-consuming design changes late in the game."

*Navigable waters and wetlands.* At least 29 States have adopted agreements to merge NEPA and the Federal Clean Water Act's Section 404 permitting process, which regulates the discharge of dredged or fill material into waters of the United States, including wetlands. In an integrated process, the emphasis is on early coordination with the U.S. Army Corps of Engineers and the resource agencies that comment on the Section 404 permit, so that the NEPA documentation and decision-making process will align with the information and procedural needs of the U.S. Army Corps of Engineers. A well-executed merger process will result in projects that are permittable, and that proceed with fewer delays. It provides a clear, consistent, and efficient process that occurs within a predictable timeframe, provides a forum to exchange information, attracts committed participants, and results in the completion of an environmental impact statement that adequately considers both the environment and the delivery of transportation projects.

Michigan and New Jersey are the only two States in the Nation where the U.S. Army Corps of Engineers has delegated Section 404 wetlands permitting authority to a State agency. Few States have exercised this option because it is very resource-intensive. However, delegated authority enables the Michigan and New Jersey DOTs to customize the permitting program to their particular needs and focus on transportation approaches that might not be available under a strictly Federal permitting system.

In Michigan, the approach provides one-stop shopping for permits, whereby only one permit application is filed with the Michigan Department of Environmental Quality (MDEQ). The Michigan DOT funds 11 fulltime MDEQ-managed positions dedicated to servicing wetlands permitting actions for transportation projects. With increased staff, MDEQ can become involved early in transportation planning and project development. On-call MDEQ staff work directly in the field with Michigan DOT staff to delineate wetlands and review projects.

*Endangered species.* As mentioned earlier, Colorado took an innovative and holistic approach to protecting a prairie ecosystem while streamlining the consultation for Section 7 of the Endangered Species Act. CDOT entered into a memorandum of agreement (MOA) with FHWA, the U.S. Fish and Wildlife Service, the Colorado Department of Natural Resources, and The Nature Conservancy. The MOA outlines programmatic clearance processes for activities on the existing road network for the next 20 years, thereby avoiding rising land costs by purchasing mitigation land at today's prices.



**The Marion Bypass (NC 226) in McDowell County, NC, shown here at sunset, provides easy access to the region's newest rest area. North Carolina employs a flexible mitigation approach.** *Photo courtesy of North Carolina DOT.*

Land purchased in advance of the need for mitigation is known as "conservation banking." Agencies meet their Endangered Species Act Section 7 responsibilities early, streamlining the regulatory process and reducing the risk of future delays on transportation projects. To compensate for unforeseen impacts and avoid reinitiation of Section 7 consultation in those cases, CDOT, FHWA, and the Fish and Wildlife Service overestimated the extent to which agency action could affect species and habitat. Examples of unforeseen situations include listing new species not anticipated by the agreement, or finding new information. Over the next few years, CDOT will preserve 6,075 to 12,150 hectares (15,000 to 30,000 acres), with a potential of up to 50,000 acres of prairie in the eastern third of the State, providing habitat for approximately 36 species, and CDOT's partners will manage those lands.

*Section 4(f).* Section 4(f) of the USDOT Act of 1966 protects publicly owned parks, recreation areas, wildlife refuges, and historic and archaeological sites that are eligible for the National Park Service's National Register of Historic Places. Section 4(f) applies to the use of these properties by transportation projects. The Nationwide Section 4(f) Programmatic Evaluations can be used when a project fits into a defined set of circumstances including a limited set of alternatives and impacts.

The Ohio Department of Transportation (ODOT) and FHWA have implemented a Section 4(f) programmatic agreement that allows ODOT to determine the applicability of the Nationwide Programmatic Section 4(f) Evaluations to projects processed under the ODOT categorical exclusion process. Categorical exclusions are actions that do not individually or cumulatively have a significant impact on the environment and therefore do not require the preparation of an environmental document.

After ODOT approves a programmatic Section 4(f) evaluation, the agency sends the evaluation to FHWA's Ohio Division and proceeds with the project without additional paperwork. FHWA, which retains its oversight and monitoring role, has 15 days from receipt of the evaluation to object. ODOT developed a Section 4(f) training manual and workshops for its district offices to help enforce compliance under the Section 4(f) programmatic agreement.

"The FHWA-ODOT Section 4(f) programmatic agreement is a major advancement in environmental streamlining," says David Snyder, environmental program coordinator with the FHWA Ohio Division Office. "This agreement gives ODOT the flexibility to move forward with project development activities while the Division is reviewing the [programmatic] section 4(f) evaluation."

## Flexible Mitigation

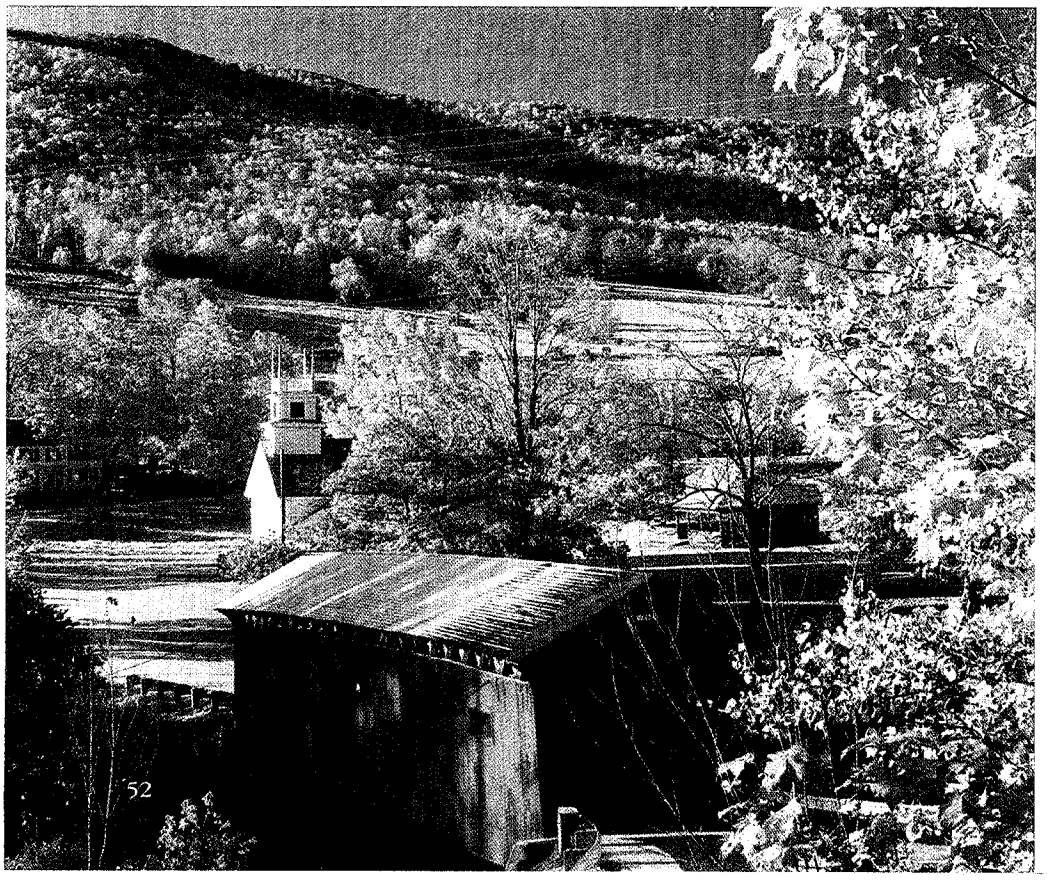
Numerous States are developing and implementing flexible mitigation approaches, such as wetlands banking or compensation strategies that promote investment in environmentally sensitive geographic regions in lieu of using site-specific mitigation only. Many State DOTs are developing the flexible approaches in cooperation with resource agencies at the State and Federal levels, and in some cases State DOTs are working directly with nonprofit organizations such as The Nature Conservancy.

The North Carolina DOT developed a flexible mitigation program in partnership with the North Carolina Department of Environment and Natural Resources, the Wilmington District of the U.S. Army Corps of Engineers, and other State and Federal agencies. Through this program, environmental issues and needs, including potential impacts, are identified and considered early in the project development and design process.

The program will provide mitigation at the watershed level with functional replacement for unavoidable impacts prior to their occurrence. Upfront compensatory mitigation is developed years ahead for project impacts, enabling the permitting process to continue without delays.

## Technology, Training, And Staff

State DOTs are maximizing financial and staff resources using various technologies, cross-training personnel, and establishing interagency personnel agreements. Technological applications are enabling DOTs to improve communication with cooperating agencies and stakeholders, and incorporate environmental considerations in business practices. Examples include online manuals, geographic information systems, electronic versions of environmental impact statements, and environmental management systems.



**In Vermont, a programmatic agreement that has reduced the time to permit projects helps preserve historic structures like this covered bridge.** *Photo courtesy of Vtrans.*

U.S. Institute for Environmental Conflict Resolution

**A neutral facilitator leads this meeting to encourage collaborative problem-solving on an environmental issue.**

Cross-training addresses human resource challenges currently faced by many State DOTs, providing opportunities for consultants and staff from resource and transportation agencies to exchange information and experiences. Training topics include NEPA, the Federal-aid highway program, and transportation planning.

Interagency personnel agreements enable the DOTs to fund dedicated staff at State and Federal resource agencies to expedite environmental reviews. At last count, 34 States have agreements that fund more than 160 personnel.

In South Carolina where an accelerated State bond program necessitates efficient delivery of transportation services, interagency personnel agreements with the U.S. Fish and Wildlife Service and several State agencies have expedited environmental reviews. "South Carolina's funded positions have helped to reduce Section 401 permit times by 30 percent and State Historic Preservation Office review times from 30 to 7 days for many projects," says Wayne Hall, assistant environmental manager with the South Carolina DOT.

## Alternative Dispute Resolution

State DOTs use facilitators to provide services such as conflict assessment, facilitation of interagency partnering agreements, design of conflict management processes, and mediation of disputes. For example, facilitators assisted with the Foothills South toll road project in Orange County, CA. After taking 28 months to achieve concurrence on a purpose and need statement, the involved agencies brought in facilitators to help develop the list of project alternatives, technical reports, and other environmental documents.

State DOTs can contract with facilitators using project funds through the Transportation Roster, which is a component of the larger National Roster of Environmental Dispute Resolution and Consensus Building Professionals, sponsored by the U.S. Institute for Environmental Conflict Resolution. The facilitators have experience in transportation cases and are familiar with NEPA, the alternative dispute resolution system, the objectives of environmental streamlining, and the transportation and environmental review processes.

## Lessons Learned

These successful streamlining practices provide practitioners at all levels of the public and private sectors with a number of lessons learned.

One lesson is to adopt environmental stewardship as a core business value. State DOTs can move from a reactive and regulatory-driven role to a proactive and innovative position by adopting environmental stewardship as a core value.

Another lesson learned is that one size does not fit all. Tailored approaches rather than prescriptive requirements enable State DOTs to retain maximum flexibility while protecting and enhancing the environment.

A third lesson is to approach transportation decisionmaking using the NEPA umbrella concept. Integrating decisionmaking provides a holistic approach to preserving and protecting community values and the natural environment.

Fourth, engage stakeholders early and often. Many of the best management practices require early and continuous involvement of stakeholders. Effective stakeholder involvement can help reduce delays and save money by expediting decisionmaking.

Next, procure staff and financial resources. Many of the best management practices are dependent on staffing and financial situations that may be unavailable at this time to some States, given current budget realities.

Finally, learn by example. A variety of resources exist that provide best management practices, including the American Association of State Highway and Transportation Officials (AASHTO) "Center for Environmental Excellence" Web site at http://itre.ncsu.edu/AASHTO/stewardship, FHWA's environmental streamlining Web site at www.fhwa.dot.gov/environment/strmlng/index.htm, FHWA's context-sensitive design Web site at www.fhwa.dot.gov/csd/index.htm, and various national and regional conferences and workshops.

Use of innovative approaches, early lessons learned, and information exchanges have helped States identify and develop streamlined and tailored approaches for the transportation development and environmental review processes. The State-specific best management practices identified here are only a sampling and far from an inclusive list. All States are advancing environmental stewardship and streamlining practices successfully by working to overcome bottlenecks and deliver a sound and environmentally responsible transportation program in a timely manner.

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**Cassandra Callaway Allwell** is a program and policy analyst at the USDOT's Volpe National Transportation Systems Center in Cambridge, MA. For the past 3 years, Allwell has provided strategic communications support for FHWA on environmental stewardship and streamlining efforts. She received a master's in regional planning from the University of North Carolina at Chapel Hill and a bachelor of science in economics from the University of Delaware.

*For more information, see www.fhwa.dot.gov/environment/strmlng/index.htm or call Cassandra Callaway Allwell at 617-494-3997.*

# Along the Road

*Along the Road is the place to look for information about current and upcoming activities, developments, trends, and items of general interest to the highway community. This information comes from U.S. Department of Transportation (USDOT) sources unless otherwise indicated. Your suggestions and input are welcome. Let's meet along the road.*

## Policy and Legislation

### USDOT Turns over TSA Reigns to Homeland Security

On March 1, 2003, the Transportation Security Administration (TSA) moved out from under the umbrella of USDOT and now is managed by the Department of Homeland Security.

TSA, the creation of Secretary of Transportation Norman Y. Mineta and Deputy Secretary of Transportation Michael P. Jackson, was established on November 19, 2001, when President George W. Bush signed the Aviation and Transportation Security Act in response to September 11, 2001.

"Creating TSA was by far the toughest, most challenging, and most satisfying endeavor I've ever undertaken," said Secretary Mineta. "Starting from a blank sheet of paper, we created an agency of more than 60,000 employees that is truly fulfilling its goal of protecting Americans as they travel across our country, and beyond."

Under Secretary of Transportation for Security Administration James M. Loy reported that TSA met 36 mandates set by Congress, including screening all passengers by the agency's first anniversary and all baggage by December 31, 2003. TSA is one of 22 Federal agencies being transferred to Homeland Security, the new Cabinet-level department led by Secretary Tom Ridge.

### New Law Requires Headlights in Work Zones

On February 20, 2003, the Pennsylvania Acting State Transportation Secretary Allen D. Biehler announced that the Commonwealth's law now requires motorists to turn their vehicle headlights on when traveling through work zones, one of many new safety initiatives that Pennsylvania will adopt this year.

According to Biehler, the Pennsylvania Department of Transportation (PENNDOT) is supplying all of its county maintenance forces with new signs to be placed at the entrances of most work zones to remind motorists to turn on their headlights. Municipalities and utility companies will use the new signs on many of their larger projects, particularly on high-speed roads.

According to PENNDOT, violating the law is punishable by a fine of $25 when signs are in place. PENNDOT will work closely with the Pennsylvania State Police to enforce the new law.

*Pennsylvania Department of Transportation*

## Management and Administration

### High-Priority Project Approved in Louisiana

In January 2003, the Federal Highway Administration's (FHWA) Louisiana Division Administrator Tony Sussmann approved the Record of Decision (ROD) for the LA-1 highway project, representing a landmark effort in environmental streamlining and contributing to more efficient movement of both foreign and domestic oil supplies.

With the signing of the ROD, FHWA formally approved the environmental impact statement (EIS) for a $520 million improvement to LA-1 that calls for the construction of approximately 26 kilometers (16 miles) of four-lane, elevated highway from Golden Meadow to Port Fourchon, with a fixed high-level bridge at Bayou Lafourche in Leeville, LA. The project will replace a substandard two-lane road that is unreliable during Gulf storms and heavy rain events, and will maintain a critical link to the south Louisiana port that plays a large role in the shipment of oil.

As a result of prioritized environmental streamlining, the ROD was accomplished in approximately 3 years, which is about half the time it normally takes to process a project of this magnitude located in such an environmentally sensitive setting. FHWA and the Louisiana Department of Transportation and Development (LA DOTD) quickly resolved complex impacts involving wetlands, fish habitat, and marsh vegetation through close collaboration with other agencies, such as the U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, U.S. Coast Guard, and the National Marine Fisheries Service.

According to LA DOTD Secretary Kam Movassaghi, LA-1 traverses the Barataria-Terrebonne Estuary, one of the most diverse and fertile habitats in the world. "This marshland, which is part of America's wetlands, is a national treasure," he says. "No less important is that LA-1 is the access to another national treasure—the oil and gas reserves in the Gulf."

*For more information, contact Michele Deshotels at LA DOTD at 225-379-1226, micheledeshotels@dotd.state.la.us, or Bill Farr at FHWA at 225-757-7615, william.farr@fhwa.dot.gov.*

*Louisiana Department of Transportation and Development*

*LA-1 Coalition*

**FHWA Louisiana Division Administrator Tony Sussmann signs the Record of Decision for the LA-1 highway project as Ted Falgout (on Sussmann's right), executive director of the Greater Lafourche Port Commission, and other stakeholders look on.**

### New Group Evaluates ITS Technologies

A new global working group, International Benefits Evaluation and Costs (IBEC), facilitates the exchange of information and techniques to evaluate the costs and benefits of intelligent transportation systems (ITS) throughout the world. The purpose of IBEC is to streamline international collaboration on techniques for evaluating ITS technologies, providing a focal point for discussion and debate on areas of interest to the international community and encouraging effective use of this information by decisionmakers.

Before the formation of IBEC, collaboration centered on a number of successful benefits, evaluation, and costs (BEC) sessions at ITS World Congresses held in Torino, Italy (2000); Sydney, Australia (2001); and Chicago, IL (2002) that were organized by ITS America and European ITS specialists. Now as a unified organization, IBEC will formalize the role of BEC session-planning at future ITS World Congresses, including the 10th World Congress on Intelligent Transport Systems scheduled for November 16–20, 2003, in Madrid, Spain.

Transport Research Laboratory Limited, an independent center for excellence in surface transport issues, is providing the Secretariat function, with funding from the United Kingdom's Department for Transport. ITS America organizes U.S. participation with assistance from the USDOT ITS Joint Program Office and the Jet Propulsion Laboratory, a federally funded research and development facility managed by the California Institute of Technology for the National Aeronautics and Space Administration.

Membership is free and open to anyone with an interest in evaluating ITS technologies and services around the world and sharing data on evaluation techniques, results, and lessons learned.

*To join, send an e-mail to IBEC@trl.co.uk. For more information about IBEC, please contact Joe Peters from the ITS Joint Program Office at joe.peters@fhwa.dot.gov.*

## Technical News

### Technology for Tracking Freight Yields Savings And Improves Security

To help develop safer and more secure technologies for tracking freight, the USDOT Office of the Secretary and ITS Joint Program Office teamed with the FHWA Office of Freight Management, the Federal Aviation Administration, and the State of Illinois to launch the first electronic air cargo manifest and security system in the United States. The recent completion of an operational test shows that the new system could bring security benefits and cost savings to future freight movements.

Formally known as the Electronic Supply Chain Manifest (ESCM) system, the technology was designed, managed, and analyzed by the American Transportation Research Institute. ESCM incorporates technologies that enable positive identification of the persons responsible for tracking the movement of cargo within and between transportation modes. Although the test focused on trucking and aviation, the technologies also have potential applications to rail and marine operations. More than 200 people are enrolled in the system, representing nearly 40 companies.

The project began almost 2 years before September 11, 2001, and one of the more important findings of the test is that appropriately designed security systems can improve business processes dramatically. Using the ESCM system, cost savings per transaction during the test ranged from $1.50 to $3.50 depending on the type of business, with greater benefits expected when combined with other systems for managing business. The ESCM security system automatically matched cargo with handlers, known shipper information, and origin and destination data.

*The final report from the operational test is available on the Internet at www.its.dot.gov. The American Transportation Research Institute offers additional information on the ESCM system at www.cargosafety.net.*

### Meet the New Mobile Asphalt Lab

The new and improved FHWA Mobile Asphalt Pavement Mixture Laboratory hit the road this spring with an array of state-of-the-art technologies and the goal of promoting long-life asphalt pavements for the 21st century.

New equipment and technology in the mobile lab provides data for performance-prediction models and supports new procedures for pavement design through advanced mixture characterization. Cutting-edge equipment for fabricating core specimens features dual-bladed saws and a coring shaft that can be used to make correctly sized specimens for the simple performance test using a dry process.

Lab technology includes video imaging equipment that can measure fine and coarse aggregate properties and equipment that detects infrared, which can be used to determine saturated surface dry condition, aggregate absorption values, and apparent specific gravity. The laboratory also runs conventional hot-mix asphalt tests, including volumetric testing for Superpave™ mixtures and in-place density measurements. Advanced testing of performance-related specifications and other innovative contracting practices can be performed as well.

Along with bringing new technologies for asphalt pavement directly to locations throughout the United


Technicians stand next to the new mobile asphalt lab.

States, the staff who operate the lab have the following goals: developing, testing, and evaluating specifications for predicting the performance of Superpave; supporting efforts by State highway agencies to ensure that construction materials and practices are high quality; and resolving issues with transportation partners related to the implementation of new pavement technologies and construction specifications.

Once a State requests a lab visit, the trailer will travel to the designated highway construction site, where lab staff will use the trailer's equipment to test local materials. After the site visit and lab tests, the staff will prepare and present a report with feedback on the test results during a closeout meeting.

*For more information or to schedule a visit, contact your local FHWA Division Office, Resource Center, or Leslie Myers at 202-366-1198, leslie.myers@fhwa.dot.gov.*

### FHWA Shares Benefits of ITS Technologies in Work Zones

The Work Zone Team at FHWA recently published a report examining the applications and benefits of ITS in work zones. *Intelligent Transportation Systems in Work Zones: A Cross-Cutting Study* shows how departments of transportation (DOTs) in Arkansas, Illinois, Michigan, and New Mexico used ITS technologies in their work zones to monitor and manage traffic, including providing traveler information and enhancing incident response.

Information covered in the report includes how the States selected the systems that they used, the design and operational characteristics, lessons learned, and the benefits experienced using the systems. The report also profiles other ITS-related products, systems, and techniques for work zones. As part of an ITS Special Study Series, the report was preceded by a brochure last year and will be followed by more detailed case study reports and an implementation guide that are under development.

*Access the report online at www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13600.html. For more information about the content of the report, contact Tracy Scriba in the FHWA Office of Transportation Operations at 202-366-0855, tracy.scriba@fhwa.dot.gov. To request a printed copy, call the ITS/Operations helpline at 866-367-7487, or send an e-mail message with shipping information to itspubs@fhwa.dot.gov.*

### FHWA Launches New Peer-to-Peer Program on Traffic Control Devices

With more than 1,000 pages of standards, guidelines, and options, the *Manual on Uniform Traffic Control Devices* (MUTCD) can be challenging to use. FHWA recently established a Peer-to-Peer Program on Traffic Control Devices (P2P TCD) to supplement the MUTCD by offering users a peer exchange for assistance and answers to questions related to traffic control devices. This service is free, provides answers to questions, and eases complexities resulting from the multitude of unique settings and circumstances found throughout the Nation's transportation network.

P2P TCD makes it easy for local, county, regional, or State agencies to request assistance and locate information. Users may e-mail requests and questions to P2P@fhwa.dot.gov or call toll-free at 888-700-PEER (7337). Upon receiving requests and questions, the P2P coordinator matches an agency with a transportation professional who is experienced and knowledgeable in the relevant technical area. The peer, in turn, contacts the agency to work out the details of the assistance to be provided.

*To become a peer on an informal basis, participate in the MUTCD Discussion Area at http://mutcd.fhwa.dot.gov/threads.cfm. To learn more about P2P TCD, visit http://mutcd.fhwa.dot.gov/com_p2p.htm or contact MUTCD Technical Expert Fred Ranck, fred.ranck@fhwa.dot.gov.*

## Public Information and Information Exchange

### Department of Energy Recognizes FHWA-Sponsored Web Sites

The U.S. Department of Energy recently recognized the family of FHWA-sponsored Web sites housed on the Pedestrian and Bicycle Information Center (PBIC) as "Web sites of the Week."

FHWA sponsors PBIC through funding provided by the Transportation Equity Act for the 21st Century (TEA-21). The PBIC sites receive more than 40,000 visitors each month and are recognized as important sources of technical information for professionals and advocates dealing with pedestrian and bicycle issues.

Among the family of sites, www.pedbikeinfo.org provides users with general information on bicycle and pedestrian safety, and more than 2,500 photo images available for downloading. Other sites that provide additional information and updates for pedestrians, bicyclists, and transportation experts include www.walkinginfo.org, which features information on pedestrian safety and pedestrian-friendly facilities; www.bicyclinginfo.org, which focuses on bicycling issues; www.walktoschool-usa.org, which covers the

Dan Burden

**Images like this one of a bicyclist traveling in a bicycle lane are among the many photographs available from www.pedbikeimages.org.**

October 8th "Walk to School Day"; and www.iwalktoschool.org, which focuses on "International Walk to School Week" activities occurring worldwide.

John Fegan, FHWA's bicycle and pedestrian program manger, comments, "The PBIC Web sites provide up-to-the-minute technical assistance on nonmotorized transportation issues to professionals and advocates in a user-friendly format."

### Georgia Uses FHWA Tool to Assess Regional Incidents

On January 23, 2003, FHWA's Georgia Division hosted a meeting of the Metro Atlanta Traffic Incident Management task force to conduct a self-assessment using the FHWA Traffic Incident Management (TIM) Self-Assessment tool. The workshop was one of the first in the Nation to use the tool to address regional issues in incident management and reduce clearance time and resulting congestion connected with nonrecurring incidents. FHWA developed the TIM Self-Assessment tool as a way to help meet one of its "vital few" priorities, congestion mitigation.

During the day-long session, more than 30 participants—representing operations, fire, law enforcement, and highway assistance partners with city and county agencies and State DOTs—reached a consensus on the status of each assessment area. Prior to the workshop, members of the task force had completed self-assessments for their individual agencies. The results of the self-assessments were compiled, analyzed, and presented during the workshop to provide a snapshot of the region's approach to incident management.

"Completing the self assessment provided a perspective on how each member agency perceived where we are as a region," says Georgia DOT State Traffic Operations Engineer Carla W. Holmes, P.E., "gave us guidance on what is needed for a viable, sustainable regional incident management program, and helped us establish a baseline against which we can measure our progress as we move forward." The session identified gaps in strategic planning, educated the regional partners on nationwide best practices, and established a framework for continuing regional, interagency cooperation.

Since the workshop, the participants have drafted an action plan based on the assessment areas, and the Georgia DOT has agreed to print a field guide to incident management for distribution to all first responders in the Atlanta region. One of the next steps will be to convene an executive session to showcase results and proven benefits to agency heads.

*For more information about Georgia's self-assessment, contact Mshadoni Smith in the Georgia Division at 404-562-3638, mshadoni.smith@fhwa.dot.gov.*

### Forum Identifies the Value of Preventative Maintenance

The Western Pavement Maintenance Forum in Industry Hills, CA, recently brought together more than 200 road surface and materials experts and other transportation professionals to address the economic necessity for State DOTs to practice preventative maintenance. Attendees learned that delaying preventative maintenance for 1 year reduces the service life of the pavement by 4 to 6 years. Also, every dollar that remains unspent on preventative maintenance results in a cost of $7 to $11 in future rehabilitation costs.

The California Department of Transportation and the California Chip Seal Association (CCSA), a nonprofit organization, hosted the 2003 forum. The agenda focused on binders, aggregates, and seals, and included topics such as chip seal, slurry seal, microsurfacing, cape seal, quality control, and other topics related to pavement preservation.

Presentations covered materials and techniques, testing and sampling, funding, and pavement management systems.

*For more information about pavement preservation, visit www.fhwa.dot.gov/preservation or contact FHWA Senior Construction and System Preservation Engineer James Sorenson at james.sorenson@fhwa.dot.gov. For information about the 2004 CCSA forum, visit www.chipseal.org.*

### Survey Reports on ITS Deployment

Preliminary results from four surveys tracking ITS deployment now are available online at www.nawgits.com/jpo/02survey_prelim. The main focus of the surveys was to examine trends at State highway agencies in disseminating information to the public through Advanced Traveler Information Systems (ATIS). FHWA surveyed more than 2,300 agencies and had a response rate of 90 percent.

The results of the survey showed that Web sites are the most widely deployed method of disseminating traveler information and that the use of e-mail also is expanding rapidly. Other data collected from the survey projects that 511 deployment will increase three- to five-fold by 2005 and that the use of kiosks to disseminate information will be one of the fastest-growing methods by 2005.

Currently, 46 ATIS systems exist in 27 States. All 46 systems disseminate road information, and 25 of them also distribute traveler and tourist information. Ten systems provide transit information, and a total of six systems disseminate all three types. Information most often distributed includes road closures, work zone and construction events, and weather.

The FHWA ITS Joint Program Office (JPO) sponsored the surveys, which were conducted in 2002, and presented the results at the 2003 annual meeting of the Transportation Research Board. The survey results are in a slide presentation developed by ITS JPO Program Assessment Manager Joseph I. Peters.

*For more information on the surveys, contact Joe Peters at 202-366-2202, joe.peters@fhwa.dot.gov.*

### Report Looks at the Worst Commuting Days in Washington, DC

Published in November 2002, the FHWA-sponsored report, *An Analysis of the Worst Commuting Days in Washington, DC,* examines traffic in the Nation's capital.

Now available online, the report shows how using a traveler information service before getting into the car could affect the commute for travelers when traffic conditions are at their worst.

Previous research using the Heuristic On-Line Web Linked Arrival Time Estimator (HOWLATE) methodology showed that the benefits of accessing traveler information before a trip multiply with increasing congestion. The HOWLATE methodology examines and analyzes how using a traveler information service could affect a commuter's trip on DC's worst commuting days.

Using archived travel times, HOWLATE reconstructs simulated driving trials by a pair of habitual commuters, one who uses a pre-trip Advanced Traveler Information System (ATIS) and one who does not. For the purpose of the report, FHWA defines ATIS as a notification-based service that selects routes and departure times. In simulated yoked trials, the two subjects conduct identical trips. Researchers pulled data on travel times from the archives of the SmarTraveler Web site (www .SmarTraveler.com) for every 5 minutes from 6:30 a.m. to 6:30 p.m. for each day.

Researchers determined the 10 worst days based on several measures—travel times, cost of travel disutility, travel expenditure, late and early schedule delays, on-time reliability, and just-in-time reliability—by sorting them for the non-ATIS user for the morning and evening peak periods. A combination of incidents, bad weather, and high demand contributed to making travel difficult during the 10 worst days.

Analyses of the worst days showed that the effect on a commuter who does not use ATIS is high and that using a traveler information service before the trip can help mitigate the adverse effect on trip predictability, cost of travel disutility, lateness risk, and late and early schedule delays. The results reflect travel for the entire Washington, DC, network, but an extension of the study will examine the effect that traveler information services can have on other congested corridors.

*The final report is available on the USDOT ITS Web site at www.itsdocs.fhwa.dot.gov.*

### Mineta Announces Winners of Student Poster Contest

On May 12, 2003, at the Travel/Transportation Conference and Exposition in Washington, DC, U.S. Secretary of Transportation Norman Y. Mineta announced the winners of the 2003 National Transportation Week Poster Contest.

The contest is an annual event designed to encourage students to explore their views on transportation, their vision for the future, and careers in transportation. This year, students in the fifth grade were invited to enter artwork that represented their thoughts on the theme "Transportation...It Keeps America Moving."

Robert Rodriguez from P.S./I.S. School 187 in New York, NY, won first place. For submitting the prize-winning artwork, he received a $200 savings bond, and his school received a $500 award. Heriberto Bajo from San Simon School in San Simon, AZ, earned second place, and Zachary D. Guerrero of Gibson Elementary in Corpus Christi, TX, submitted the third place entry.

**Secretary Mineta presents a certificate to Robert Rodriguez, the winner of the 2003 National Transportation Week Poster Contest. From left to right: Emma Moncayo, Robert Rodriguez's mother; Robert Rodriguez; Secretary Norman Y. Mineta; and Dionicio Rodriguez, Robert Rodriguez's father.**

*To view the winning posters or learn more about National Transportation Week, visit www.ntweek.org/posters. Also see the inside back cover of* PUBLIC ROADS.

## Personnel

### Secretary Mineta Names Whitmer Deputy Chief of Staff

In February 2003, USDOT Secretary Norman Y. Mineta announced Martin T. Whitmer Jr. as the new deputy chief of staff, replacing Vincent T. Taylor who became the assistant secretary for administration at USDOT in January.

"Whitmer has helped the Department move forward on many important issues," Secretary Mineta said, "most notably surface transportation policy, safety, energy, and environmental stewardship."

In addition to serving as deputy chief of staff, he also will serve as the Secretary's point person on the reauthorization of TEA-21 and the energy bill.

Whitmer joined USDOT in March 2001 as the Secretary's policy assistant, advising him on highway, transit, energy, motor carrier, and safety issues. From 1997 until 2001, Whitmer was the vice president of government relations for the American Road and Transportation Builders Association, where he directed legislative and coalition activities that helped enact TEA-21. Whitmer served as a lobbyist for the Laborers' International Union of North America from 1994 to 1996. In 1993, he worked for the National Rifle Association and former U.S. Senator Phil Gramm (R-TX). Whitmer earned his undergraduate degree in government at Georgetown University and received a joint law and master's degree from the Columbus School of Law at The Catholic University of America in Washington, DC.

# Internet Watch

*by Keri A. Funderburg*

## Protecting the Environment One Web Site at a Time

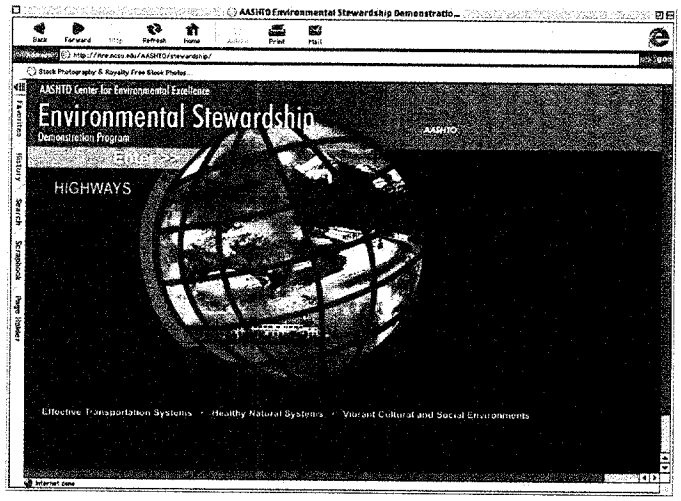
The phrase, "Think Globally, Act Locally," has been a popular environmental slogan for years. Since the development of the Internet, an updated version of this catchphrase might be "Think Globally, Act Technologically," as an increasing number of resources related to environmental stewardship and streamlining become available online. With a few clicks of the mouse, transportation professionals can access environmental information hosted on Web sites developed by the Federal Highway Administration (FHWA), the U.S. Department of Agriculture (USDA) Forest Service, the American Association of State Highway and Transportation Officials (AASHTO), and others. This issue's column shares highlights from a few of these resources.

### The Crossroads of Animals And Transportation

When designing projects, engineers frequently must determine how to integrate transportation infrastructure with wildlife resources. Engineers and other professionals now can turn to three new Web sites to find creative solutions to the wildlife-transportation issue.

Available at www.wildlifecrossings.info/beta2.htm, the USDA Forest Service "Wildlife Crossings Toolkit" features a searchable database of case histories on mitigation measures, articles on decreasing wildlife mortality, links to related Web sites, and a glossary of engineering and biological terms. The USDA Forest Service and the San Dimas Technology and Development Center developed the toolkit with support from FHWA, the Western Transportation Institute, the Jack H. Berryman Institute for Wildlife Damage Management at the Utah State University, and the S.J. and Jessie E. Quinney Foundation.

The Center for Transportation and the Environment (CTE) "Wildlife, Fisheries, and Transportation Web Gateway" Web site at www.itre.ncsu.edu/cte/gateway/scantour_index.html features information collected in October 2001 during an international technology scan of Europe. FHWA, in cooperation with AASHTO and the National Cooperative Highway Research Program, sponsored the tour to learn how agencies across the Atlantic address wildlife-transportation issues. (See also "Scan of the Wild," PUBLIC ROADS, November/December 2002.) While in Europe, the scan team collected numerous publications on wildlife habitat connectivity across European highways. The CTE recently compiled and posted a bibliography of the publications, along with the final report from the scan, links to related materials, and a video of the scan. The publications also are available from the CTE online research database, "Wildlife Ecology and Transportation" (www.itre.ncsu.edu/cte/wildlife.htm), which contains more than 1,200 records and links to relevant literature and Web sites.




**AASHTO's "Environmental Stewardship Demonstration Program" Web site provides State transportation agencies with technical assistance on environmental matters.**

Finally, FHWA developed the "Keeping it Simple" Web site (www.fhwa.dot.gov/environment/wildlifeprotection), which highlights more than 100 ways for State departments of transportation (DOTs) to help protect wildlife. Methods include installing bird boxes, planting mangroves, and recycling construction debris to create new habitats. Users can search the site—which includes success stories from all 50 States—by State or category, such as roads, bridges, wetlands, or waterways.

### Getting into the Act

Under the National Environmental Policy Act (NEPA) of 1969, FHWA is required to evaluate the potential impacts of proposed transportation facilities on sensitive social and environmental resources. To provide information on the NEPA process, FHWA created two Internet resources targeting project planners, managers, and other transportation professionals.

The first resource is the "NEPA: Project Development Process" Web site (www.fhwa.dot.gov/environment/00001.htm), where users can access information on many NEPA-related topics, including the FHWA environmental policy, project development guidance, and public involvement. The Web site also has a section on compliance with Section 4(f) of the U.S. Department of Transportation Act of 1966, which prohibits the use of certain publicly owned lands and historic sites unless the projects meet certain qualifications. In addition, the Web site features links to other NEPA-related Internet resources.

Another resource is the FHWA "Re:NEPA" environmental exchange (http://nepa.fhwa.dot.gov). Divided into topic areas such as environmental justice, NEPA documentation, and legal issues, this site serves as a collaborative tool for exchanging information on the NEPA process and transportation decisionmaking. Links to each topic area lead users to online reference sections for download-

ing papers and articles, electronic discussion areas for posting NEPA-related questions, works-in-progress sections where users can review drafts of reports and papers posted by other users, and membership directories containing contact information for each topic area. Users also can sign up to receive e-mail notifications about new postings in specific subject areas.

### Sharing Ideas on Stewardship

To showcase the ongoing efforts of State DOTs to improve the environmental results of their programs and projects, the AASHTO Center for Environmental Excellence sponsors the AASHTO Environmental Stewardship Demonstration Program. By accessing www.stewardship.transportation.org, State DOTs can register examples of stewardship projects in their States, and other States can learn what their peers are doing to protect the environment through individual projects, at the programmatic level, or through institutional or organizational changes. Information available on the site includes project descriptions, evaluations of results, budget data, and contact information. Examples of projects currently featured include a study of environmental costs underway in Wisconsin and a new initiative in Utah focused on context-sensitive design solutions.

### E-Newsletter

To share environmental information on a regular basis, FHWA has developed several electronic newsletters. For example, FHWA's Office of the Environment distributes the monthly "Successes in Streamlining" e-newsletter (www.fhwa.dot.gov/environment/strmlng/whatsnew.htm), which highlights current practices in environmental streamlining from around the country. Recent articles have discussed Web sites on environmental management developed by State DOTs and the use of integrated decisionmaking in project planning. To subscribe to "Successes in Streamlining," contact Sara McKinstry at 617-494-3581 or mckinstry@volpe.dot.gov.

The Office of the Environment also distributes "Greener Roadsides" (www.fhwa.dot.gov/environment/greenerroadsides), a quarterly e-newsletter on managing roadside vegetation. Targeting transportation decisionmakers, the newsletter features articles on topics such as plant restoration, protection of native plants, and mitigation of damage to wetlands. To join the mailing list for "Greener Roadsides," e-mail Bonnie Harper-Lore at bonnie.harper-lore@fhwa.dot.gov.

These Web sites are just a few examples of the environmental Internet resources currently available to transportation professionals. Each day, the Internet continues to offer new sets of tools to help highway engineers, planners, designers, and decisionmakers enhance communities, save species, and protect and preserve the environment—all while providing safe mobility for motorists.

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**Keri A. Funderburg** is a contributing editor for PUBLIC ROADS.

# Communication Product Updates

*Compiled by FHWA's Office of Planning, Environment, & Realty*

## Vegetation Management

*Common Roadside Invasives*
This full-color reference guide highlights 100 invasive weeds commonly found along the Nation's roadsides. Included are common terrestrial and quickly spreading herbaceous plants, many of which are widespread and well-established problem weeds. State departments of transportation (DOTs) can use the guide as a tool to train personnel responsible for roadside management. With full-color illustrations of each weed species and lamination for protection from the elements, an accompanying field guide serves as a quick reference.

*Proceedings of the 2002 Weeds Across Borders Conference*
This publication features the proceedings from a conference held in May 2002 to examine the influence of surface transportation on the introduction and spread of invasive plants from a North American perspective. The recent trend to improve highway and rail traffic connections across the U.S. borders with Canada and Mexico leads to concerns that exotic plants will spread along the improved corridors as a result of increased cross-border traffic. The proceedings document the goals and results of the conference to connect across-the-border counterparts, share information, and determine possible partnerships that could help combat the further introduction and spread of invasive plants.

Visit: www.fhwa.dot.gov/environment/vegmgt/weedbdrs.htm.

## Noise

*Highway Traffic Noise in the United States: Problem and Response*
This brochure, written from a layperson's perspective, discusses the three-part approach to dealing with traffic noise in the United States and contains Federal Highway Administration (FHWA) noise regulations.

See: www.fhwa.dot.gov/environment/probresp.htm.

*Entering the Quiet Zone: Noise Compatible Land Use Planning*
Targeting local officials, developers, and the public, this brochure provides information about the problem of highway traffic noise and effective solutions, specifically addressing actions that should be part of programs for local growth and development.

Visit: www.fhwa.dot.gov/environment/noise/quietzon/index.htm.

*Keeping the Noise Down: Highway Traffic Noise Barriers*
Aimed at the public, this brochure presents basic information on noise barriers, specifically answering questions about what noise barriers are, when they are required, how they are funded, how they work, etc.

See: www.fhwa.dot.gov/environment/keepdown.htm.

*Highway Noise Barrier Design Handbook*
A state-of-the-art technical reference, this manual covers acoustical and nonacoustical considerations in the design of noise barriers. Featuring common concepts, designs, materials, and installation techniques, the manual targets professional highway engineers, acoustical designers, planners, and nonprofessional community members.

Visit: www.fhwa.dot.gov/environment/noise/manual.htm.

## Air Quality

*Transportation Air Quality: Selected Facts and Figures*
This brochure provides an overview of facts and figures on the linkages between transportation and air quality. The brochure focuses on transportation-related emissions trends, policies, technologies, and standards that affect on-road mobile sources, including automobiles and light- and heavy-duty trucks.

Visit: www.fhwa.dot.gov/environment/aqfactbk/index.htm or contact Adrica Coates at 202-366-6724.

*The Congestion Mitigation and Air Quality Improvement Program*
This pamphlet provides an overview of the Congestion Mitigation and Air Quality Improvement Program (CMAQ), including information on funding levels, eligibility, and benefits of CMAQ-funded projects.

See: www.fhwa.dot.gov/environment/cmaq/index.htm or contact Adrica Coates at 202-366-6724.

*A Sampling of Emissions Analysis Techniques For Transportation Control Measures Final Report*
This report describes modeling tools and techniques for assessing the emissions benefits of control measures in transportation projects applying for CMAQ funds.

Visit: www.fhwa.dot.gov/environment/cmaqeat/index.htm or contact Adrica Coates at 202-366-6724.

*Strategic Workplan for Particulate Matter Research: 2000 to 2004*
Summarizing the state of knowledge of transportation-related pollution from particulate matter, this workplan examines future research needs for the monitoring, characterization, analysis, and control of pollution from particulate matter.

See: www.fhwa.dot.gov/environment/pm/stratwkp/index.htm or contact Adrica Coates at 202-366-6724.

*It All Adds Up to Cleaner Air: A Collaborative Transportation and Air Quality Public Education and Partnership Building Initiative, The First Five Years*
It All Adds Up to Cleaner Air is a joint effort by FHWA and the U.S. Environmental Protection Agency (EPA) to educate the public about the connections between travel choices, congestion, and air quality. The report describes how FHWA and EPA initiated the campaign and shares the experiences of the demonstration communities that first implemented the program.

Visit: www.italladdsup.gov/pdfs/toolkit/Inside_Report30.pdf or contact Kathy Daniel at 202-366-6276.

## Air Quality Conformity

*Transportation Conformity: A Basic Guide for State and Local Officials*
See: www.fhwa.dot.gov/environment/conformity/con_bas.htm.

*Transportation Conformity Reference Guide*
Visit: www.fhwa.dot.gov/environment/conformity/ref_guid/index.htm.

*Research Products*
See: www.fhwa.dot.gov/environment/conformity/con_res.htm.

*Sensitivity Analysis of MOBILE6 Motor Vehicle Emission Factor Model*
FHWA recently completed a sensitivity analysis to evaluate the model behavior of MOBILE6, the current EPA model for emissions factors. The results provided an understanding of the model's behavior, especially the impacts of using localized data as compared with national default data. For copies of the report, contact Tianjia Tang at 404-562-3673.

Visit: www.kytc.state.ky.us/Multimodal/pdf/Mobile6-RC.pdf.

## Water Quality

*The National Highway Runoff Data And Methodology Synthesis*
This report provides an overview of the characteristics of highway stormwater runoff to help decisionmakers, planners, and highway engineers assess and mitigate possible adverse impacts on the Nation's receiving waters. It also provides a catalog of information, defines the necessary documentation needed to ensure the validity of data for water quality analyses, and evaluates available sources for current and foreseeable information needs. Contact Patricia Cazenas at 202-366-4085.

*Management of the Discharge and Quality Of Highway Runoff in Karst Areas to Control Impacts to Ground Water*
This publication presents the results of a pooled fund study to address the impacts of stormwater runoff from highways on groundwater in karst areas. The project also tested the effectiveness of a peat-filtration system in removing contaminants from highway runoff. Contact Connie Hill at 804-775-3378.

## Brownfields

*Transportation Options for Brownfield Redevelopment*
Describing the results of a study conducted to understand the nature of brownfield-transportation developments around the country, this report identifies factors that promote the success of such developments and describes the extent to which U.S. Department of Transportation (USDOT) programs have been instrumental in their success. The final report is under review and should be available by late 2003. Contact Connie Hill at 804-775-3378.

## Wildlife

*Wildlife Habitat Connectivity Across European Highways*
This report presents the findings from an international technology scan tour sponsored by FHWA, the American Association of State Highway and Transportation Officials, and the National Cooperative Highway Research Program. The goal of the scan was to learn about European strategies to address habitat and wildlife issues associated with transportation systems. A delegation of Federal, State, and conservation group representatives visited France, Germany, the Netherlands, Slovenia, and Switzerland to observe and document efforts in Europe. The report provides conclusions and recommendations for U.S. applications in the areas of policy, communications, guidance manuals, and research on wildlife and transportation.

Visit: http://international.fhwa.dot.gov/Pdfs/wildlife_web.pdf.

## Wetlands

*Wetlands Accounting Database*
FHWA developed this interactive database as a tool to provide users with updatable information on all classes of highway projects with wetlands impacts and 404 permit requirements. The database can track and summarize the status of wetlands permits and data on impacts and mitigation for construction projects on a State, regional, or national basis. Information available in the database includes project number and type (bridge, reconstruction, etc.), location, drainage characteristics of the wetlands impacted, mitigation activities, costs per unit area, and the status of project permits. The database will help manage wetlands impacts from highway projects and compile performance data on mitigation tactics. For a copy of the database, contact Fred Bank in the FHWA Office of Natural and Human Environment at 202-366-5004 or fred.bank@fhwa.dot.gov.

## Environmental Streamlining

*Highway and Transit Environmental Streamlining Progress Summary: Report to Congress February 2002*
Visit: www.fhwa.dot.gov/environment/strmlng/ssprtcr.htm.

*Collaborative Problem Solving: Better and Streamlined Outcomes for All*
See: www.fhwa.dot.gov/environment/strmlng/cmgtnepa.htm.

*National Procedures for Elevating to the Secretary: Disputes Involving Environmental Reviews of Transportation Projects, Discussion Draft*
Visit: www.fhwa.dot.gov/environment/strmlng/npdjan22.htm.

## What Can Telecommunications Technologies Do for Your Highway?

Whether building roads, installing traffic signals, or deploying intelligent transportation system (ITS) technologies, virtually everything transportation professionals do today involves communication. The telecommunications network provides the backbone for collecting, analyzing, and sharing transportation data—both within the industry and with the traveling public. But, according to Bill Jones of FHWA's ITS Joint Program Office, since technical information becomes outdated quickly, many transportation professionals are not familiar with the newest technologies available on the market.

The goal of a recently updated course offered by the Federal Highway Administration's (FHWA) National Highway Institute (NHI) is to bring transportation professionals up to speed with the latest telecommunications technologies. The course, ITS Telecommunications Overview (#137005A), is part of the core curriculum established by FHWA's ITS Professional Capacity Building program. The 1-day course provides transportation professionals with a broad introduction to the latest telecommunications technologies—including new high-speed techniques available through wireless and in- and above-ground cable systems—and offers practical lessons learned in the application of ITS technologies.

Upon completing the course, participants will be able to do the following:

- Explain the fundamentals of telecommunications at a basic level
- Define some of the key terminology and concepts used in transportation telecommunications
- Recognize current issues with developing, designing, operating, and managing transportation projects using telecommunications technologies and infrastructure
- Plan and conduct requirements analyses to match devices and components to telecommunications technologies
- Use regional ITS architectures for telecommunications planning

Those likely to benefit most from the class include transportation professionals in the public and private sectors who are involved in transportation planning and ITS deployment, such as project planners, engineers, managers, senior technicians, and systems integrators at metropolitan planning organizations, transit agencies, other municipal offices, State highway agencies, FHWA Division and Resource Center Offices, and the Federal Transit Administration.

"Every transportation engineer in the field today should be familiar with the jargon of the people working in the telecommunications industry," says Bill Jones, technical director for wireless and telecommunications in FHWA's ITS Joint Program Office. "The main objectives of this course are to give engineers a speaking knowledge of the latest technologies in the field and to demonstrate how they can be used in transportation applications."

*For technical information about the course, contact William S. Jones at 202-366-2128, william.s.jones @fhwa.dot.gov. To learn more about transportation-related training courses available from NHI, consult the course catalog at www.nhi.fhwa.dot.gov or contact NHI at 4600 N. Fairfax Drive, Suite 800, Arlington, VA 22203; 703-235-0500 (phone); or 703-235-0593 (fax). For scheduling, contact Danielle Mathis-Lee at 703-235-0528 or danielle.mathis-lee@fhwa.dot.gov.*

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*(continued from p. 62)*

*Interagency Guidance: Transportation Funding for Federal Agency Coordination Associated with Environmental Streamlining Activities*

See: www.fhwa.dot.gov/environment/strmlng/igdocs/index.htm.

*Evaluating the Performance of Environmental Streamlining: Development of a NEPA Baseline for Measuring Continuous Performance*

Visit: www.fhwa.dot.gov/environment/strmlng/baseline/index.htm.

*Successful Efforts in Environmental Streamlining: Eight Case Studies in Project Development*

To assist in the future application of Section 1309 of the TEA-21 legislation and other environmental streamlining initiatives, FHWA identified and prepared eight case studies that highlight successful measures to move a highway project through the NEPA process. Copies are available on CD. Contact Kreig Larson at 202-366-2056 or kreig.larson@fhwa.dot.gov.

*Evaluating the Performance of Environmental Streamlining—Development of a NEPA Baseline for Measuring Continuous Performance: Phase II Report*

This report is a followup to the initial *Phase I Report*. Phase II examines more than twice the number of transportation projects cataloged in the previous investigation, focusing on projects with environmental impact statements that were completed between 1995 and 2001. Contact Kreig Larson at 202-366-2056 or kreig.larson@fhwa.dot.gov.

# Conferences/Special Events Calendar

| Date | Conference | Sponsor | Location | Contact |
|---|---|---|---|---|
| Sept 3-4 2003 | Task Force on Nonmotorized Transportation and State Bicycle and Pedestrian Coordinators' Meeting | American Association of State Highway and Transportation Officials (AASHTO) and Vermont Agency of Transportation | Burlington, VT | Jim McDonnell, P.E. 202-624-5448 jimm@aashto.org |
| Sept 4 2003 | National Partnership for Highway Quality (NPHQ) Awards Conference | AASHTO and NPHQ | Minneapolis, MN | Bob Templeton 512-301-9899 btemplenphq@aol.com www.nphq.org |
| Sept 7-10 2003 | International Conference on Highway Pavement Data, Analysis and Mechanistic Design Applications | Ohio Research Institute for Transportation and the Environment, Ohio Department of Transportation (DOT), Federal Highway Administration (FHWA), and others | Columbus, OH | Shad Sargand 740-593-0625 ICHP@bobcat.ent.ohiou.edu http://webce.ent.ohiou.edu /ICHP.html |
| Sept 10-14 2003 | ARTBA Annual Convention | American Road and Transportation Builders Association (ARTBA) | Washington, DC | Ed Tarrant etarrant@artba.org 202-289-4434 |
| Sept 13-17 2003 | SASHTO 2003 Mountains of Opportunity | Southeastern Association of State Highway and Transportation Officials | Charleston, WV | Phyllis Holmes 304-558-0444 pholmes@dot.state.wv.us www.wvdot.com/sashto |
| Sept 18-20 2003 | ASCC Annual Conference 2003 | American Society of Concrete Contractors (ASCC) | Dallas, TX | Beverly Garnant ASCC 314-968-8130 www.ascconc.org |
| Sept 20-24 2003 | IBTTA 71st Annual Meeting | The International Bridge, Tunnel and Turnpike Association (IBTTA) | Paris, France | Nicole Neuman nneuman@ibtta.org 202-659-4620 |
| Sept 24-26 2003 | Task Force on Roadside Safety | AASHTO and Louisiana Department of Transportation and Development | New Orleans, LA | Jim McDonnell, P.E. 202-624-5448 jimm@aashto.org |
| Sept 27-Oct 1 2003 | ACI Fall 2003 Convention | American Concrete Institute (ACI) | Boston, MA | ACI, Event Services 248-848-3795 conventions@concrete.org www.concrete.org |
| Oct 18-22 2003 | IBTTA Maintenance Committee Fall Conference | IBTTA | San Antonio, TX | Nicole Neuman 202-659-4620 nneuman@ibtta.org |
| Oct 19-21 2003 | National Transportation Management Conference | AASHTO and Eno Transportation Foundation, Inc. | Williamsburg, VA | Donna Tamburelli 202-624-5815 donnat@aashto.org |
| Oct 19-21 2003 | 3rd Forensic Congress | American Society of Civil Engineers (ASCE) | San Diego, CA | Jon Esslinger 703-295-6295 jessling@asce.org www.asce.org/conferences /forensic2003/about.cfm |
| Oct 22-24 2003 | 28th Annual Conference on Deep Foundations | Deep Foundations Institute | Miami Beach, FL | Shirin Madon 201-567-4232 dfihq@dfi.org www.dfi.org |
| Oct 28-29 2003 | 5th National Conference on Asset Management | Transportation Research Board | Seattle, WA | Thomas Palmerlee 202-334-2907 tpalmerlee@nas.edu |
| Nov 12-15 2003 | Civil Engineering Conference and Exhibition | ASCE | Nashville, TN | Leonore Jordan 703-295-6110 ljordan@asce.org www.asce.org/conferences/ annual03 |

# National Transportation Week

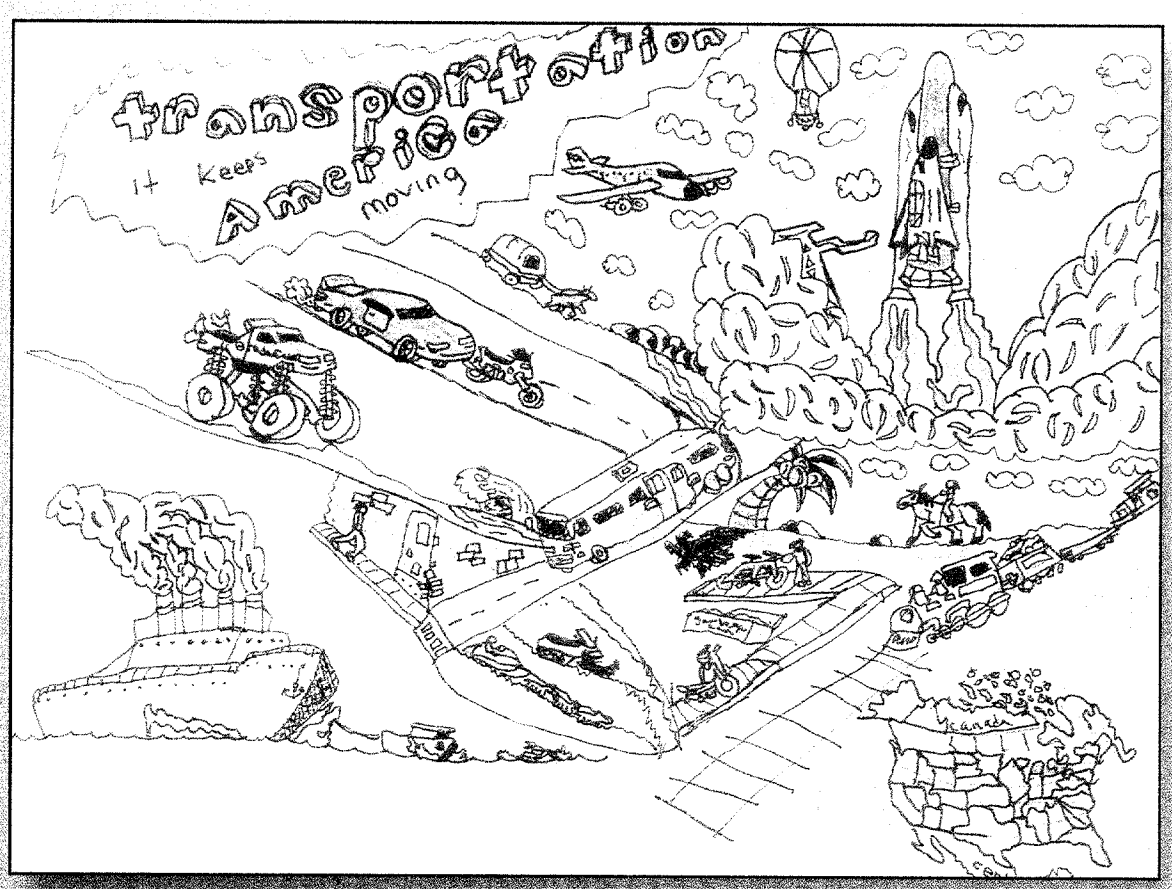
## Congratulations Poster Contest Winners!

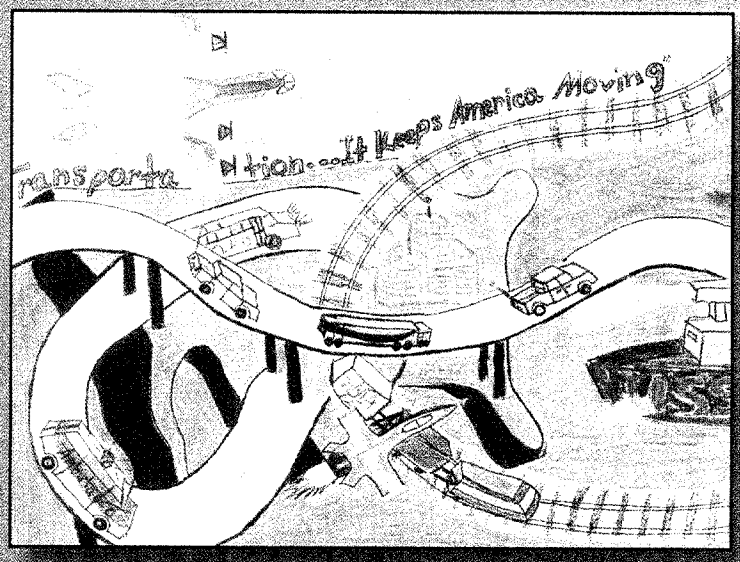
An annual event for students to explore their views on transportation, their vision for the future, and careers in transportation.

This year's theme:
**"Transportation... It Keeps America Moving"**

### 1st Place

Robert Rodriguez
5th grader
PS/IS 187
New York City



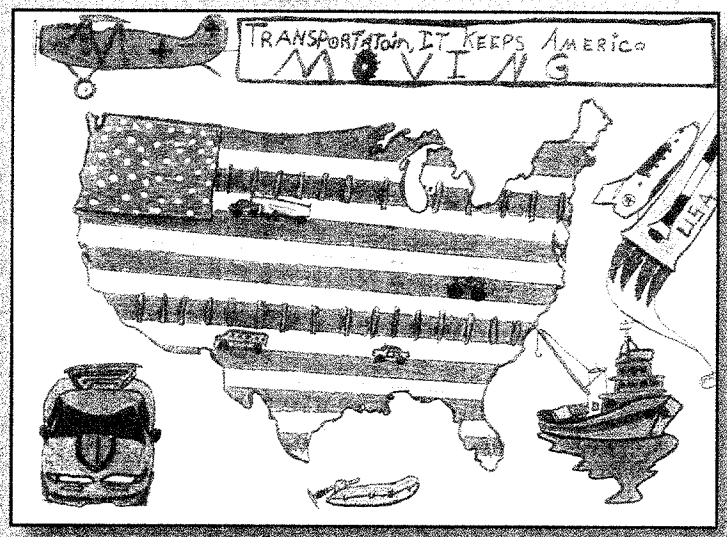




### 2nd Place

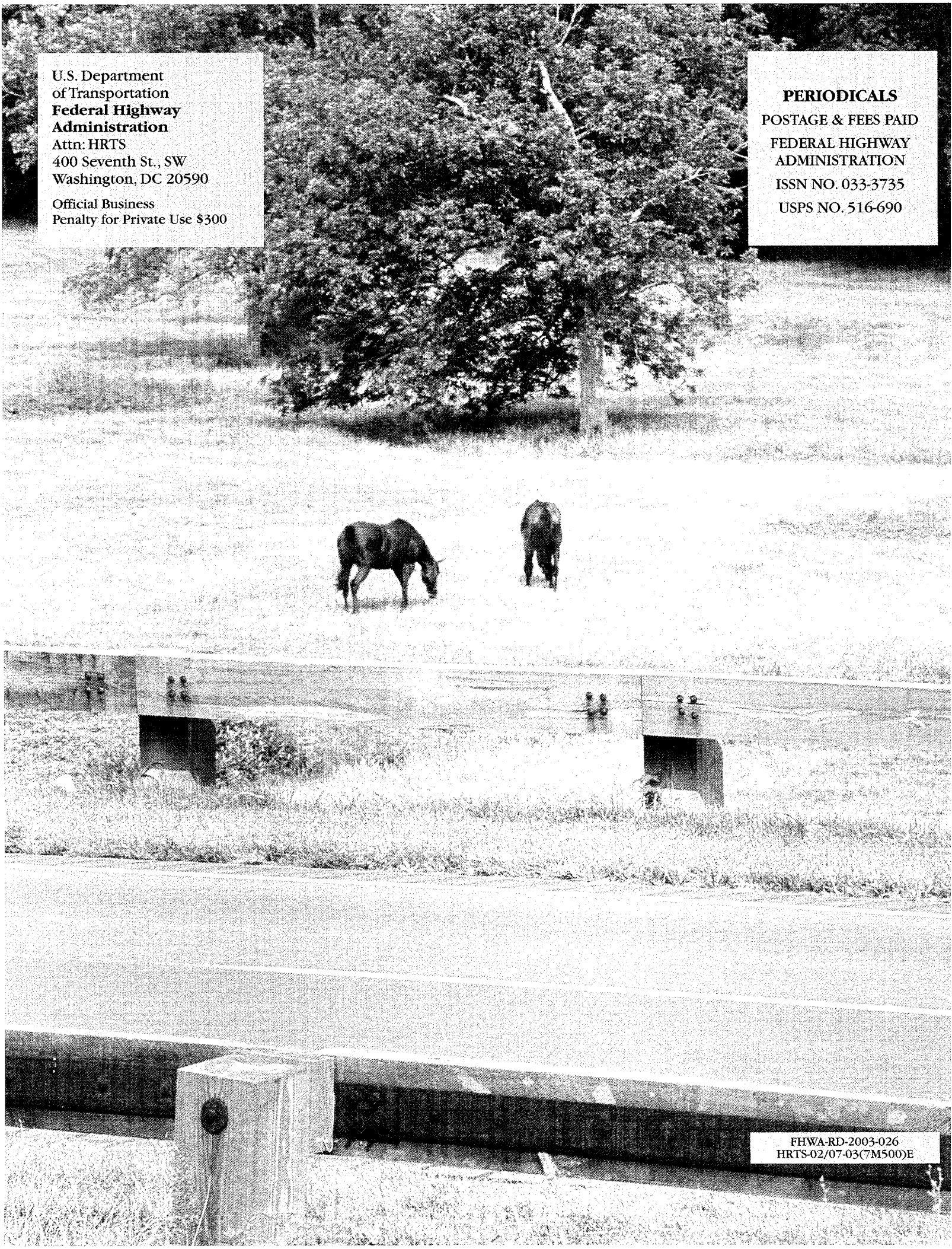
Heriberto Bajo
San Simon School, San Simon, AZ

### 3rd Place

Zachary D. Guerrero
Gibson Elementary, Corpus Christi, TX




U.S. Department of Transportation
Federal Highway Administration



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of Transportation
**Federal Highway Administration**
Attn: HRTS
400 Seventh St., SW
Washington, DC 20590

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Penalty for Private Use $300

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